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BIRD MIGRATION RECORDS OF WILLIAM BARTRAM.

1802–1822.

BY WITMER STONE.

Plates IX, X, and XI.

THERE is preserved in the library of the Academy of Natural Sciences of Philadelphia a well worn manuscript volume with pages about four by six inches and a pasteboard cover upon which is inscribed in almost illegible characters "Calendar of Natural History, Memorable Events &c" while page one bears the heading "Calendar for the Year of our Lord 1802."

There follows a daily record of the state of the weather, the blooming of plants and trees and the appearance of birds, insects and other forms of animal life, after the manner of Gilbert White's Calendar in his Natural History of Selborne.

An insert informs us that this is the manuscript diary of William Bartram during the years 1802 to 1822, kept at the old Bartram homestead on the Schuylkill in Kingsessing, now a part of the city of Philadelphia, though at that time several miles out in the country.

The Bartram place established by John Bartram, father of William, and like him a famous botanist, is now preserved as a city park under the name of Bartram's Garden. Here one can still see the old house built by the elder Bartram with his own hands, and can walk along the box-bordered paths and admire the various trees, shrubs and herbs brought by the Bartrams from various

parts of the Middle and Southern states, or raised from seeds obtained in exchange from more remote countries.[1]

What is more interesting to the ornithologist is the fact that to this same garden came Alexander Wilson the Scottish schoolmaster, from his little county school house which stood near by, and largely under the influence of William Bartram and the famous garden, he developed into Alexander Wilson the American Ornithologist.

The diary begins with the very year that Wilson came to Kingsessing and had Bartram only seen fit to record his impressions of the young schoolmaster and his subsequent activities, what an historical storehouse this little volume would be! He kept it strictly a 'Calendar of Nature' however, and so far as we can gather from its pages such a man as Alexander Wilson might never have lived.

But there is a mine of information in these closely written pages and the data on bird migration constitute, we believe, the oldest record, covering a series of years, that we have for any part of North America. The record is by no means complete and every year one or more common birds are omitted, while we must remember that Bartram was familiar with only a portion of our native birds and made no pretense of being an 'ornithologist.'

The diary is not continuous and the writer, like many another keeper of journals found that it was easier to start on New Year's than it was to continue the record day after day. It runs from January 1, 1802 to September 20, 1808 missing here and there a few days or once or twice as much as a month, and always more detailed in winter and spring than later in the year. Then there is a gap until January 1, 1814 and another from February 13, 1814 to January 1, 1818, from which point it continues until December 31, 1822, about seven months before the death of the writer, whose increasing feebleness is reflected in the wavering lines of the handwriting. Eleven spring seasons are thus included, but only the most familiar birds are noted every year. Bartram was sixty-three years of age at the opening of the calendar and eighty-four

[1] *cf.* William Bartram, By George Spencer Morris. 'Cassinia', 1906, p. 1. The illustrations used in this biographical sketch are reproduced in 'The Auk' through the courtesy of the Delaware Valley Ornithological Club.

at the close, but his constant out door life and the favorable situation of the gardens offset any lack of ability due to age and make it probable that he recorded the common species as soon as they came about his house.

I have recently read the journal through and have copied out every reference to birds. These I have arranged systematically and now through the courtesy of Dr. Edward J. Nolan, librarian of the Academy of Natural Sciences of Philadelphia, I am able to present them to the readers of 'The Auk' with such comments as seem pertinent.

As these data, separated from the botanical and meteorological information with which they were originally associated, give one no idea of the character of the daily entries, I have reproduced verbatim the greater part of the record for January, 1802, and the more important zoölogical data for the remainder of that year.

From these the reader will be brought into sympathy with the writer and will be enabled to picture the gentle old man, looking after his farm and pottering about his beautiful garden on the river shore and each evening by candle light jotting down in his little book the events of the day that stood out most prominently in his simple life.

Following this will be found the systematic compilation of bird migration data and a comparison of the average dates of arrival for certain species with the average dates of arrival at Philadelphia one hundred years later.

CALENDAR FOR THE YEAR OF OUR LORD 1802.

Jany. 1. The weather serine and as warm as in the month of May after a white frost in the morning. The fields and gardings green with growing vegetables, several species in flower and abundance of insects darting in the air and birds singing as in the spring of the year, frogs lively in the springs. Wind south east.

2. Slight white frost, the day exceedingly warm and pleasant as yesterday, Wind S. W. Spiders darting their webs wasps flying about (*Vespa anularis*) the blewbird sings (*Motacilla Sialis*). Evening calm and warm.

5 Slight frost this morning, midday warm, wind Northerly evening calm and serene, wind S. W. Mockbird Not yet left us on his passage to the south (*Turdus polyglottos*)

6 White frost this morning and some ice but midday very warm and pleasant. Afternoon cloudy evening hazy, warm and thawy, wind E. Birds numerous, Snow Birds, sparrows, woodpeckers, golden crowned ren, titmice (*parus atricapillus, P. cristatus*) Nut hatch (*Sitta canadensis*), Crows numerous, Hawks of various species. Blue bird, Robins (*Turdus migratorius*) and an endless variety of insects

7 Last night plentiful showers of rain, air warm, cleard up in the afternoon, the wind S. W. evening serene and warm. Frogs whistle, the sparrow hawk scream (*Falco sparverius*).

11 Clear with high westerly winds and pritty coald, the wind setted at the north west with strong winds & very coald.

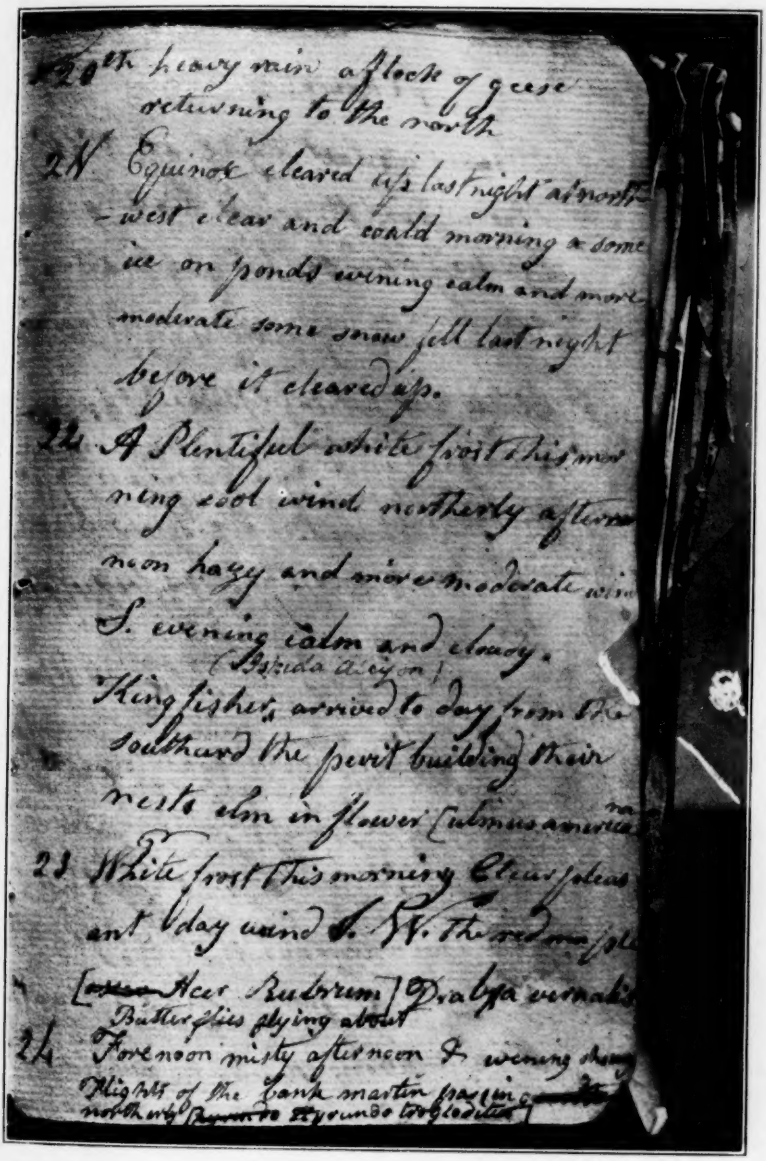
15 Clear and warm as May day, no ice to be seen in the river, the bees out till evening flying about. Sparrow hawk & Blew bird. Crocus verna, Narcissus, snowdrops, Tulip Above ground. Hamamelis is full bloom. Wind S. W.

17 Some frost this morning moderately cool but pleasant all the day, evening hazy, wind southwardly Ducks on Schoulskill

19 A Beautiful white frost this morning, a fine clear warm day, the river Schuykill exhibits very little signs of winter and the corn fields green as in the month of may. Wind S. W.

23 Chilly and cloudy Cleared up before sunset evening serene moderately cool, wind N. E. Blue birds, Fringilla Tristis (Yellow Bird), Fringilla Purpurea (Purple finch)

25 Coald and freesing, some snow Seen to fall tho the wind was S., cleared up before sunset, the wind N. W., evening serene and cool. the owl screamed last night.


20th heavy rain a flock of geese
returning to the north
21 Equinox cleared off last night at north-
-west clear and cold morning & some
ice on ponds evening calm and more
moderate some snow fell last night
before it cleared off.
22 A Plentiful white frost this morn
ning cool wind northerly afterno
noon hazy and more moderate wind
S. evening calm and cloudy.
(Betula alba)
King fishers arrived to day from the
southward the pewit building their
nests elm in flower (ulmus americana)
23 White frost this morning Clear pleas
ant day wind S. W. the red maple
[acer Rubrum] Draba vernalis
Butterflies flying about
24 Forenoon misty afternoon & evening cloudy
Flights of the Bank martin passing
northward

A PAGE OF THE BARTRAM 'CALENDAR.'

27 Large flights of Crows to the southward (Corvus frugivorus)

31 Clear pleasant and moderate weather, no frost, the fields and pasture green as in the spring. Grass and grain growing night and day. Spring Aconite (heleborus) in flower in the garden. Large flocks of ducks in the river Schuilkill. The face of the earth exhibits more the appearance of spring than winter

February 1 A large flight of blew birds past by from the southward.

2. Seeds of vegetables vegetate in the garden such as radish, larkspur and many other kinds; many in flower as primula, Daphne, mezrium &c

10 Bees are out of the hives seeking for flowers

14 A small flock of red-wings (Oriolus phoenicia), the Blew birds begin to pair

15 Peach buds swell

16 Wood Cock (Scolopax rufa) Arrived from the southard Filbert in flower.

17. The ground Squirrel came out of their winter quarters frisking about in the warm sun. The Crow Blackbird (Gracula Barita) arrived from the southard The alder in blossom

21. A fine warm day. large flights of red wings. People swiming the Schuilkill afternoon

22. Began to snow this morning before light and continued increasing all day the air extremely cold.

23 Blue Birds flying about

March 2. Flights of red-wing passing from the southard and flocks of Cedarbirds.

3. Flights of Redwings and ducks passing from the southard

5. Wild Geese passing northerly.

10 The Killdear (Charadrius vociferus); Dwarf Dafodill and snowdrops in flower

11 Spring frogs whistle, flocks of various kinds of ducks in Schuilkill from the southard.

12 The crossbill passing Northerly.
15. Blew birds build their nests.
16. Sun set very red last night. Crocus verna in full flower; shad frog.
17. Flocks of Birds of Passag flying northerly.
18. Smoky sun, warm growing weather. Pewit and Cowpen bird arrived from the south ward. Wind S.
20. Heavy rain, a flock of geese returning to the north.
22. Kingfisher (Ispida alcyon) arrived today from the southard, the pewit building their nests; elm in flower (ulmus americana)
23 The red maple (Acer Rubrum), Draba vernalis in flower. Butterflies flying about
24 Flights of the bank martin passing mortherly (Hyrundo trogloditus)
26. Snow lies three inches deep and the trees loaded with it
27. Most of the snow disappeared
30. Turtle Dove Cooing (Columba Carolinaensis)
31. Cloudy, warm growing weather. Spice Wood (Laurus Benzoin), Rock Saxifrage (Saxifraga rupestris), Rock Cress (Arabis lyrata), Skunk Cabage (Dracontium foetidium) in flower. This last plant has been in flower five or six weeks.

April 2 The little grey fly-catcher (Muscicapa grisea) arrived from the Southward. The Aspen tree Populus heterophyla in flower. The glow worm sparkle in the grass
4. Peach trees beginning to bloom
7 The house swallow arrived (hirundo domestica)
11. Fox-coloured thrush (turdus rufus) arrived
12. Fishing hawk (Falco piscatorius) and Woodthrush (Turdus minor) arrived from the south.
13. Blue Violet and Claytonia virginica in flower
14 The turtle Dove Coos (Columba carolinensis)
15. Quaw bird (Ardea Nycticorax) arrived
17. Ice seen this morning. Peaches and cherries suffered by the frost last night
19. Chewink (Fringilla Erythropalma), Pine creeper (Parus pinus), arrived. Wild Tulips (Erythronium), Viola

pedata, Anamone nemorosa. Least wood Thrush (Turdus trogladitus)

20 White frost this morning. Sasafrass in flower. Yellow Butterfly (Pappillio)

21. A little white frost this morning. Warm pleasant Day Garden Ren (Motasilla familiaris), Summer Yellow Bird Motasilla estivalis. Plumbs, Currens, Rasberrys full in Bloom. Aplles beginning to flower. Sweet firn, Liquidamber perigrinum in bloom and swarming with bees sucking honey from the flowers

22. Cat Bird. (Lucar.)

25 Wippoor will (Caprimulgus Virginica) arrived.

26 Maryland Yellow-throat, (Motasilla —) the little olive Coloured warbler (Motasilla olivacia). Tree frog Rana —.

28 Hanging bird, (Oryolus Baltimora) & O. spuria hummingbird (Trochilus colubris). Lylac (Syringa comunis) Water leaf (Orontium aquaticum)

29. Elm seed ripe

May 2. Redstart (Motasilla rutasilla).
The Apple tree in full flower. The borer Bee out visiting thee flowers.

3. Read head (Picus eriocephalus), Chimney Swallow (Hirundo pelagia), May Bird (Alauda calandra), Marsh Sparrow (Fringilla palustris) Arrived. Rye in ears, Dogwood (Cornus florida). Tumble turf (Scarabius) and Several species of Butterflies

4. Yellow-breasted chat (Motesilla trochilus). A great variety of small birds of the genus of Motacilla and Parus. Nearly all the Summer passinger birds Arrived.

5. A Bull frog swallowed a large mole instantly

6. Male rice bird (Emberiza oryzivora) arived

7. Blew linnet (Emberiza cyanea) Arrived. Various species of the Dragonfly (Libellula). Wasp begin to build their nests.

9. Crested flycatcher (Muscicapa Crinita)

20 Cool for the season. this has been heatherto the coolest spring, the work of vegetation almost suspended,

esculent vines such as cucumbers, mellons, squashes etc that have come up are mostly destroyed by the cool rains and chilling air and all other kitchen Garden vegetables much injured by the Coald.

21. The lightning fly sparkles in the night (Cantharus —)
22. Ardea virescens, Green bittern, Muscicapa rapax wood pewit arrived. Wheat just begining to ear appears to be blasted in many instances, young birds drownded in their nest on the ground by the heavy rains.
27. Cool. The fire-side is agreable morning and evening.
31. Early cherries and strawberries begining to ripen young birds leave their nests such as blue birds, robins, crow blackbirds.

June 22. Warmest day that we have had this summer
29 A male bird of Loxia Oryzivora found dead under a tree about five mile from philadelphia, supposed to have escaped from a cage Grain harvest has begun
30. A luminous Northern light this evening. (Aurora borealis)

July 9. Morning clear and cool, evening cool enough to sit comfortably by the fireside
21. Apples ripe. Oat harvest. Some cases of yellow fever in the city.
23. Lilium superbum in flower we have a plant now in the Garden the stem of which is upwards of eleven feet high terminating in a pyramed, at top composed of 32 perfect Flowers and exhibits a truly superb spectacle.
25. Sow Buckwheat. Whistling Cricket (Tetigonia) in the Evening and Night. Cicada.
28 Fire Flies abundant.

August 7. Malignous Fever rages in Philadelphia and Baltimore, The inhabitants on recommendation of the Board of Health are moving out onto the Country.

September 6. Whip-or-will crys this evening they are now on their passage to the South.

[lapse until Dec. 1.]

December 2. MockingBird yet with us feeding on Smilax berries
4. Heavy white frost some Ice Mockbird.

11. Cold and frosty. Butcher Bird.
13. Schuylkill scaled over with Ice. Yet Picus auratus, Yellow Rump, Blue Bird, Butcher Bird and Mock Bird are with us.
15. Clear and cold. Mock bird, Yellow Rump, Robbins, and Blue Birds
18. Slight fall of snow. Picus auratus, Butcher Bird
20. Rained all night Mock-Bird
22. Ampelis feeding on Fruit of Celtis, Juniperus and Diosperus
24. Evening serene and calm A very small Owl was caught having no horns, (*capitæ laevi*) not much exceeding the size of a sparrow much like one Figured by Edwards a native of Hudson's Bay.
25 Morning clear. Schylkill scaled-over with Ice surface of the earth white with hoar frost. serene & warm all day evening calm & moderate wind southerly.
26. Cloudy and moderate. Bluebird
30. Drizzling day. Some Snow about noon but soon turned to Rain
31. Cleared last night. Morning cool. Blue Bird Butcher Bird, Fringilla tristis, Regulus cristatus. No Ice in Schuylkill. Wasps flying. Moles throw up the Earth. Frogs in springy places. Dracontium foetidum above ground.

SYSTEMATIC LIST OF BIRD NOTES.

Larus argentatus. HERRING GULL.

Gulls are still frequent on the river in winter as far as Bartram's Garden and must have been plentiful in his time. He apparently only thought of mentioning them when compiling a particularly full winter list, or at an unusually late date. These are the only records:

1821. February 19. Sea gulls from south passing to the north.
April 11. Gulls.
1822. February 22. Sea gulls.

Sterna hirundo. COMMON TERN?

1822. April 11. Rain showers all night, cleared this morning, blustery Terns.

Anatidae spp. DUCKS.

Nowhere, perhaps, is the difference in bird-life one hundred years ago more noticeable than in comparing Bartram's notes on the abundance of ducks to be seen on the river, with the scattering individuals that now venture to stop there. We find the following spring records:

1802. January 17. Ducks in Schoulskill. Pleasant day wind S.
" 31. Large flights of Ducks in the river.
March 3. Flights of Ducks passing from the southard showery all day and warm, wind S.
" 11. Flocks of various kinds of Ducks in Schuilkill from the southard. Pleasant forenoon succeeded by wind.
1803. February 2. Several sorts of Ducks arrived from the South on their return to the North viz: *Anas nigra*, *A. boschas*, *Mergus merganser*. Foggy and drizzling, changed about noon with rain from the south.
" 23. Green-winged Teal passing to the North. clear pleasant warm day wind S.
" 28. Flocks of Ducks passing northward. Ice on ponds. After sunrise became cloudy and thawy. Evening cloudy and warm; like for rain. Wind S. E.
March 4. Great numbers of Ducks in Schuylkill from the south. Warm pleasant day, wind S.
" 14. Ducks passing northerly. Morning cloudy and misty, cleared about noon.
1804. February 12. Ducks arrive from the south. Pleasant warm day. Wind S. W.
" 19. Black Duck arrived from the south on their passage or return to the north. Warm pleasant spring weather.
" 21. Blue-winged & Green-winged Teal migrating north on their return to breed. Clear pleasant weather. Wind S.
" 27. Flocks of Ducks in Schuylkill arrived from the south. Morning clear and cold, afternoon hazy, and thawy wind S. W. Ice driving with the tide.
" 29. Ducks from the south. Hazy, warm, thawing weather. Wind S. W.
April 17. Flocks of Ducks returning from the north. Cool, rain, wind high N. E.
1805. February 23. Large flights of Ducks. Warm and pleasant Wind S.[1]

[1] There is much irregularity in the fullness of the record and the meagre mention of ducks in some years does not, I feel sure, indicate their scarcity.

1806. March 30. Ducks and Teal arrived from the south. Wind S. Some Ice on ponds this morning. Noon and evening warm and delightful. Peach nearly in bloom as also Elm and Maple.
1818. January 27. A few fishing Ducks. Wind N. E. a little thawy, Schuylkill clear of Ice.
March 9. Ducks arrived from S. Pleasant moderate day.
" 13. Teal from the south passing northerly. Warm as May, wind S. Snowdrops. This evening the spring and shad Frogs.
1819. March 26. Ducks. Forenoon clear fine spring weather, Wind S.
" 31. Ducks passing Northerly. Cold blustering day. Wind N. W.
1820. March 27. Ducks passing northerly. Warm growing weather. Land frog chatters.
1821. February 10. Teal passing northerly. Cloudy. Wind W.
" 19. Ducks from the south passing to the north. Pleasant warm day. Wind S.
1822. February 22. Ducks from the south. Clear moderate, wind N. W.

Autumn duck records are few and I find only the following:

1804. October 3. Several kinds of Ducks pass. Clear and pleasant, wind S. W.
" 24. Cloudy, showery about noon, cleared afternoon, wind N. Soon after great flight of Ducks passing southward.
1818. August 24. Blue-wing Teal. Morning clear and cold Wind N. W. Evening cloudy & rain.

Branta canadensis canadensis. CANADA GOOSE.

1802. March 5. Wild Geese passing Northerly.
" 20. A flock of Geese returning to the north.
1803. March 14. Some Wild Geese have passed.
" 30. Wild Geese passing northerly all Day.
1804. March 17. Flocks of Geese flying to the north.
" 21. Geese passing northward.
1805. March 8 and 17. Flocks of Geese pass by to north.
1807. April 16. Large flights of Geese passing northerly.
1808. March 8. Geese from southward.
" 16. Flocks of Geese passt by from So. in morning.
1814. February 13. Wild Geese (*Anser canadensis*) pass northerly.
1819. March 26, 31 and April 10. Geese passing northerly.
1820. March 27. Geese passing northerly.
1821. April 21. Large flights of Geese passing North.
1822. March 15. Flights of Geese passing to the north.

The autumnal records are as follows:

1804. October 20. Flocks of Geese pass south.
" 24. Great flight of Geese passing southward.
1805. October 6. Geese pass to the South.
November 8 and 10. Flocks of Geese passt by.
1807. October 17. Wild Geese passing southerly.
1818. November 27. Flights of Wild Geese passing southerly.
1820. October 25. Wild Geese pass southerly.

Branta bernicla glaucogaster. BRANT.

One record on April 16, 1820 'Brant Geese passing northerly.'

Chen hyperboreus nivalis. GREATER SNOW GOOSE.

1807. April 15. Pleasant, clear Forenoon, wind S. which bro't a large Flight of white Brant Geese & a pair of Ravens. The former passt on to the north, the latter westward. Afternoon & evening wind N. No fruit trees yet in bloom. Cornel Tree in blossom.

Ardea herodias herodias. GREAT BLUE HERON.

Only mentioned once:
1803. April 14. *Ardea Herodias* arrived. Misty, sun appeared 2 or 3 hours about Midday red as blood through dry mist or Smoke.

Butorides virescens virescens. GREEN HERON.

Entered as 'Green Bittern' or as '*Ardea virescens*,' arriving on the following dates:

1802. May 22.
1805. May 4.
1806. April 28.
1807. April 20.
1822. May 4.

Nycticorax nycticorax naevius. BLACK-CROWNED NIGHT HERON.

Always entered as the 'Quaw-bird' usually with '*Ardea Nycticorax*' added. Arrived:

1802. April 15.
1803. April 7.
1805 April 23.
1820. April 13.
1822. May 4.

Philohela minor. WOODCOCK.

The records of what was then evidently a very common species are as follows:

1802. February 16. Wood Cock (*Scolopax rufa*) arived from the southard.

1803. March 11. Wood Cock (*Scolopax rufa*) arived. Spring Frog whistles.
" 14. Wood Cock pair.
November 28 and December 26. Woodcock.
1804. September 20. Woodcock yet with us. Equinox.
" 26. Woodcock yet with us.
1805. March 18. Wood Cock pair.
1807. March 16. Wood Cock (*Scolopax*) arived.
1818. March 13. Woodcock screeps this evening.
1819. March 6. Woodcock this evening.
" 20. Woodcock whistles. The earth covered with snow this morning but all melted before night.
October 8. Woodcock.
1822. March 8. Woodcock arived.

Gallinago delicata. WILSON'S SNIPE.

Only twice mentioned
1803. March 7. Meadow Snipe (*Scolopax minor s. arvensis*). Snow this morning, cloudy and chilly all day.
1807. April 7. Meadow Snipe arived. Pleasant spring weather. Rock Saxifrage & Hepatica in flower.

Actitis macularia. SPOTTED SANDPIPER.

Arrival recorded three years of '*Tringa macularia*'.
1805. April 14. 1820. April 24.
1818. April 17.

Bartramia longicauda. UPLAND PLOVER.

Only mentioned once. Though he used the common vernacular name, the use of the word *Tringa* shows that he understood its true affinities.
1818. May 10. Wistling Plover (*Tringa*) arived.

Oxyechus vociferus. KILLDEER.

The records simply mention the arrival of the 'Killdeer', 'Kildear' or '*Charadrus vociferus*.'
1802. March 10. 1818. February 18.
1803. March 11. 1820. February 17.
1805. February 24. 1821. March 1.
1807. February 22. 1822. March 8.

Limicolae. OTHER SHORE-BIRDS.

1819. April 18. Tringas and Plovers arived.
1822. April 11. Tringa passing northerly.

Colinus virginianus virginianus. BOB-WHITE.

1803.	January	9.	Partredges.
	August	15.	Partredge resumes their Winter language.
1804.	January	28.	Partredges call *Ho-oi-hee*.
	February	11.	Partredges.
1818.	January	17.	Partredge. Our Partredge migrates southerly at commencement of winter, but yet abundance remain with us, perhaps northern broods.
1822.	May	4.	Partredge (*Tetrao marlandica*).

Ectopistes migratorius. PASSENGER PIGEON.

This bird is recorded in but three of the years covered by the Journal. Whether like some other species it seemed to the writer too common to merit mention except when it occurred in unusual numbers, or whether the records given constitute the only occasion when the birds occurred near the garden, I cannot say. Wilson writing at this very period states that, "Every spring as well as fall more or less of them are seen in the neighborhood of Philadelphia, but it is only once in several years that they appear in such formidable bodies, and this commonly when the snows are heavy to the north, the winter here more than usually mild, and acorns, &c., abundant."

Bartram's records are as follows:

1803.	March	16.	Clear warm day, Alder in flower. Large flights of Wild Pidgions.
	September	11.	Wild Pidgeons arived from North Clear & dry, wind southerly. Poke berries & wild Grapes ripe.
1804.	January	7.	Wild Pidgeons in the Forest feeding on Acorn. The day warm as summer, evening cloudy.
	February	19.	Large Flights of Wild Pidgeons (*Columba migratoria*). Warm, pleasant, spring weather, seeds vegetate in open ground.
	March	1.	Pidgeons flying northerly. Cloudy morning, began to snow about 11 o'clock. Every appearance & feeling of winter.
	"	13.	Pidgeons in flocks. Rainy day cleared at evening.
	April	8.	Flights of Pidgeons. Cool, flying clouds from N. W.
	April	22.	Flocks of Pidgeons flying northerly Cloudy & warm, wind S. River Schuylkill overflowing, the rapid waters carry along Bridges, rafts, & timber sweeped from the shores.
1807.	January	9.	Wild Pidgeons flying in flocks clear & cool.
	February	10.	A flight of Pidgeons passt. by Northerly. Cloudy and thawy, evening tempestuous with rain.

THE BARTRAM HOUSE, BARTRAM'S GARDEN, PHILADELPHIA.
From a Sketch by George Spencer Morris.

Zenaidura macroura carolinensis. MOURNING DOVE.

1802. March 30. Turtle Dove Cooing (*Columba carolinaensis*).
April 14. The Turtle Dove Coos (*Columba caroliniensis*).

It is then recorded as present: 1803, Jan. 10, 15, 19, 26. Feb. 12, 15 ('in flocks') 18, 27 and March 3; 1804, Feb. 19; 1807, Jan. 4; 1818, Dec. 23; 1821, May 12.

Cathartes aura septentrionalis. TURKEY VULTURE.

Only once mentioned. They occur in this region now only as straggling individuals and a flock is very rare so that conditions appear to be about the same.

1804. June 1. Flock of *Vultur aura.*

Pandion haliaëtus carolinensis. OSPREY.

Arrival recorded for seven years, usually under the name 'Fishing Hawk,' but once as 'Fishing Eagle' and once as '*Falco piscatorius*'.

1802. April 12.	1807. April 16.
1803. April 29.	1818. April 2.
1805. April 7.	1819. April 17.
1806. April 15.	

Haliæetus leucocephalus leucocephalus. BALD EAGLE.

1803. January 10. Grey Eagle.

Falco sparverius sparverius. SPARROW HAWK.

Evidently a common resident then as now:
Mentioned in winter lists on January 7, 1802 and January 6, 1804.

Falcones spp. HAWKS.

The river meadows below the Gardens have always been a great rendevous for hawks.

'Hawks of various species' mentioned as present on January 6, 1802, January 9, 1803, and February 2, 1805 also:

1804. December 3. Many Owls & Hawks seen flying, sign of cold stormy weather coming.
1818. November 1. Hawks (*Falco*) arived from north.

Cryptoglaux acadica acadica. ACADIAN OWL.

1802. December 24. A very small Owl was caught, having no horns (*capitae laevi*) not much exceeding the size of a sparrow.

Megascops asio asio. SCREECH OWL.

1802. January 25. The Owl screamed last night.
1803. January 3. Little Horned Owl appeared near the House hunting mice.
February 20. Little Owl (*Strix asio*) whistles this morning about Daybreak.

Also recorded on February 21, 1807, January 12, 1814, July 14, 1818 and January 16, 1820.

Coccyzus americanus americanus. YELLOW-BILLED CUCKOO.

Date of arrival of the 'Cuccow' recorded six times, and once as '*Cuculus carolinensis.*' Bartram evidently did not distinguish the two species.

1803. May 7.
1804. May 6.
1805. April 30.
1807. May 12.
1818. May 8.
1820. May 4.
1822. May 2.

Ceryle alcyon alcyon. BELTED KINGFISHER.

Dates of arrival are given for six years. Usually the bird is called simply 'Kingfisher' but sometimes '*Ispida alcyon.*' Apparently Bartram never found it in winter.

1802. March 23.
1804. April 8.
1805. April 7.
1818. March 16.
1821. April 11.
1822. April 13.

In autumn he has the following. Evidently the bird did not summer about the garden, nor does it today.

1818. August 27. Kingfisher arived from north with their young.
October 9. Kingfisher arived from the north on their passage to the south.
1820. October 17. Kingfisher.

Dryobates pubescens pubescens. DOWNY WOODPECKER.

1818. January 17. *Picus punctatus* (least speckled woodpecker).

Sphyrapicus varius varius. YELLOW-BELLIED SAPSUCKER.

1804. October 19. *Picus varius* arived from N.
1818. January 17. *P. varius* (Pine Woodpecker).
November 10. Pine Woodpecker arived from the north.

Ceophlœus pileatus abieticola. PILEATED WOODPECKER.

Listed but once; without comment. Now long extinct in the vicinity of Philadelphia

1818. January 17. *Picus pileatus.*

Melanerpes erythrocephalus. RED-HEADED WOODPECKER.

Six dates of arrival are given by Bartram for the 'Red-head Woodpecker,' 'Red-head' or '*Picus eriocephalus*.'

1802. May 3.	1819. May 5.
1803. May 4.	1820. May 1.
1818. May 10.	1822. May 8.

In the autumn there is one record

1818. October 8. Red-head Woodpecker yet with us.

There are also two records of a Woodpecker which I take to be this bird in the juvenal plumage, which is worn well into the first winter.

1818. January 17. *Picus cinereus*.
October 8. Grey Woodpecker yet with us.

Colaptes auratus luteus. FLICKER.

Bartram refers to this bird as '*Picus auratus*,' 'Golden wing Woodpecker' and 'Flicca,' but mentions it only in the winter months when its occurrence, apparently, as at present, was regarded as worthy of note. He mentions it as present, December 13 and 18, 1802; January 11, 26, February 5 and December 10, 1803; January 6, 1804; January 1, and 5, 1819 and December 10, 1820. Usually he simply uses his quaint phrase 'yet with us' but on February 5, 1803, he tells us that they are 'feeding on Celtis, Red Cedar &c'.

Chaetura pelagica. CHIMNEY SWIFT.

The swift is termed 'Chimney Swallow,' '*Hirundo pelasgia*' or 'Chimney-bird' by Bartram and its arrival is recorded as follows:

1802. May 3.	1806. April 26.
1803. May 2.	1818. May 11.
1804. April 29.	1819. June 5.

Bartram particularly mentions after the last 'first appearance this year.' It seems inconceivable however that it had not arrived in the vicinity long before. In fact all his dates for this species are late compared with recent observations.

For the Autumn he gives three records

1803. September 29. Chimney-bird left us.
1806. September 9. Chimney-bird yet with us.
1821. August 19. Chimney Swallow yet with us.

Archilochus colubris. RUBY-THROATED HUMMINGBIRD.

Almost always referred to as the 'Huming Bird' to which is added in one instance *Trochilus colubris*. Dates of arrival as follows:

1802. April 28.	1819. May 4.
1803. April 21.	1820. April 26.
1818. May 10.	1822. May 1.

On the second date of the list he adds that 'Apple and Judas Trees bloom and Glow-worms sparkle'. In the autumn the 'Huming Bird' was 'yet with us' on September 19, 1804, October 14, 1805, October 16, 1806, on which day there was white frost; September 3, 1818, and September 15, 1819.

Tyrannus tyrannus. KINGBIRD.

The 'Kingbird's' arrival is recorded for nine seasons.

1803.	May 4.	1819.	May 7.
1804.	May 4.	1820.	May 14.
1806.	April 28.	1821.	April 25.
1807.	April 20.	1822.	May 1.
1818.	May 9.		

In autumn it was 'yet with us' on September 3, 1818.

Myiarchus crinitus. CRESTED FLYCATCHER.

Recorded regularly as '*Muscicapa crinita*,' the vernacular name being used but once.

1802.	May 9.	1821.	May 10.
1818.	May 8.	1822.	May 9.
1819.	May 22.		

Myiochanes virens. WOOD PEWEE.

Only the following, although the bird according to Wilson was a regular breeder in the garden.

1802. May 22. *Muscicapa rapax*, Wood Pewit, arrived.
1822. May 3. Wood Pewit.

Sayornis phœbe. PHŒBE.

One of the few species whose arrival is reported every year, always under the familiar name of 'Pewit.' The dates are as follows:

1802.	March 18.	1818.	March 13.
1803.	March 15.	1819.	March 24.
1804.	March 22.	1820.	March 17.
1805.	March 7.	1821.	March 10.
1806.	March 9.	1822.	March 8.
1807.	March 16.		

The nest building of 'Pewit' is chronicled in

1802.	March 22.	1805.	March 18.
1803.	March 21.	1818.	April 3.
1804.	April 27.		

In the autumn 'Pewit yet with us' is recorded on

1803.	October 8.	1818.	September 3.
1804.	October 14.	1819.	September 18.
1805.	Sept. 30, Oct. 9, 12, 14 and finally Nov. 1.	1820.	October 12.

1806. December 1.

Among the few records for 1814 when the diary lasted but a month and a half we find this interesting note:

1814. January 13. Moderate winter weather. Ice in the River but driving with the Tides. Pewit was seen.

Otocoris alpestris alpestris. HORNED LARK.

1803. January 9. *Alauda alpestris.* Morning clear & cold River frozen over near half inch thick of Ice.
1804. February 19. *Alauda alpestris.* Warm pleasant spring weather.
1818. January 17. *Alauda alpestris.*

Cyanocitta cristata cristata. BLUE JAY.

'Jays' are recorded on January 5 and 9, 1803; January 24, 1804; February 2, 1805; March 13, 1818; January 26 and December 30, 1822. The winter is the only time when any attempt is made to give complete lists of birds seen, which accounts for the mention of many resident species at this season only.

Corvus brachyrhynchos brachyrhynchos. CROW.

Crows are reported in January of nearly every year.

1802. January 27. Large flights of Crows to the southward (*Corvus frugivorus*).
1805. February 2. Large flights of Crows pass morning & evening to & from their roosts.
1822. February 22 Flights of Crows passing to N. E.

These records apparently refer to the roost at Merchantville, N. J.

May 18, 1818. 'Young Crows' are recorded.

Corvus corax principalis. RAVEN.

1807. April 15. A pair of Ravens passt westward.

Dolichonyx oryzivorus. BOBOLINK.

1802. May 6. Male rice bird (*Emberiza oryzivora*) arived.
1803. May 13. Rice Bird arived.
June 2. Female Rice Bird passing to the north after the males to breed.
1818. May 10. Rice bird (Bob-lincolin).
1819. May 17. Rice birds on their passage northerly.
1822. May 3. Rice bird passing northerly.

The only autumn record is:

1818. August 24. Rice birds arrive from the north to feed on grain of Zizania, Persicaria & grass.

Molothrus ater ater. COWBIRD.

The arrivals of the 'Cowpen Bird' are as follows:

1802.	March 18.	1808.	March 22.
1803.	March 12.	1819.	April 6.
1805.	February 23.	1822.	April 19.
1807.	March 17.		

Agelaius phœniceus phœniceus. RED-WINGED BLACKBIRD.

Usually Bartram speaks of the 'Red-wing Blackbird' sometimes abbreviating it to 'Redwing' and occasionally using 'Red-wing Sterling,' or 'Blackbird, *Oriolus phoenicia*'.

1802.	February 14.	1808.	March 3.
1803.	February 8.	1818.	February 28.
1804.	February 16.	1819.	February 10.
1805.	February 11.	1820.	February 15.
1806.	February 20.	1821.	February 19.
1807.	February 22.	1822.	February 22.

Additional records are of 'flights passing northerly all day' — March 11, 1803, etc. While on December 10, 1803 and December 29, 1819 he writes 'Red-wings yet with us'.

Icterus spurius. ORCHARD ORIOLE.

Recorded as '*Oriolus spurius*' except once when '*O. bicolor*' is used presumably referring to this species.

1802.	April 28.	1820.	April 23.
1808.	April 25.	1822.	April 30.
1819.	April 28 (*O. bicolor*).		

On July 24, 1804 is the record '*Oriolus spurius* yet given us short songs.

Icterus galbula. BALTIMORE ORIOLE.

The records are as follows:

1802. April 28. Hanging bird (*Oryolus Baltimora*).
1803. May 3. Baltimore.
1806. April 28. Oriolus [possibly the other species].
1818. May 2. Baltimore arrived.
1820. April 26. *Oriolus baltimore.*
1822. May 1. *Oriolus baltimore,* Hangnest or Baltimore Fire bird.

Also one autumn record.

1804. August 19. Baltimore Bird yet with us.

Sturnella magna magna. MEADOWLARK.

Recorded either as '*Alauda magna*' or 'Meadow Lark.' It is mentioned in winter lists on Jan. 9, Feb. 21, Dec. 11 and 26, 1803; Jan. 6, 1804; Feb. 3, 1808; Jan. 17, 1818; Dec. 10, 1820; Jan. 3, 1821; Dec. 8 and 30, 1822. On April 2, 1819; and March 5, 1820, the first spring singing is recorded.

Quiscalus quiscula quiscula. PURPLE GRACKLE.

Usually referred to as 'Crow Blackbird,' '*Gracula Barita*' or '*Gracula purpurea*' and once as '*Grackle.*' Arrivals:

1802.	February 17.	1818.	March 1.
1803.	February 23.	1819.	March 6.
1804.	March 11.	1820.	February 17.
1805.	February 22.	1821.	February 26.
1807.	March 12.	1822.	February 22.

There are two autumn records, October 9, 1820 and November 30, 1822 when Bartram writes 'Crow blackbirds yet.' while, on September 11, 1820 he records 'Evening flight of blackbirds passing to their roost in Jersey' This may of course refer in part at least to the Red-wing.

Loxia curvirostra minor. RED CROSSBILL.

1802.	March	12.	Crossbill passing Northerly. Drizzling warm day.
1803	October	9.	*Loxia curvirostra* arived from N. Asters, Golden rods, Helianthus, Rudbeckia and Coreopsis in flower.
	December	24.	Crossbill in Flocks feeding on Pine seeds & Seeds of the Ash. Christmas Eve.
	"	26.	Crossbill.
1805.	February	26.	Crossbill arived from south on their way northward.
1819	January	5 and 6.	Crossbill.

Carpodacus purpureus purpureus. PURPLE FINCH.

Referred to as 'Purple Finch' and '*Fringilla purpurea,*' usually mentioned only in midwinter, when more complete lists were recorded.

It is mentioned as present on Jan. 23, 1802; Jan. 15, 1803; Jan. 26, 1804; Feb. 28, 1818; January 2 and 6, 1819; and December 30, 1822.

On January 27, 1804 is the record 'Purple Finch feeding on seeds of the Ash' and on October 12 of the same year 'Purple Finch' & Hemp bird arrived from the north.' What the 'Hemp bird' might be I have been unable to ascertain but it is possible that the females and immature males of the Purple Finch may have been so designated. The 'Hempbird' was also present on Jan. 12, 1821.

Acanthis linaria linaria. RED-POLL.

There are the following records. That of April 30 is unusual but it seems certainly to refer to this species.

1818. January 18. Snow, Last night freezing. *F. rubricapilla* (Red-cap Finch).

April 30. Little red-cap Finch busy picking Affides off the Apple buds. Frost this morning, cold, blusterous.
1822. January 19. Red-crowned Linnet.
January 25, and 29. *Fringilla flammea.*

Astragalinus tristis tristis. GOLDFINCH.

Entered as '*Fringilla tristis*,' once with 'Yellow Bird' added. Jan. 23 and Dec. 31, 1802; Jan. 18, and Mar. 13, 1818 and Jan. 1 and 6, 1819.

Plectrophenax nivalis nivalis. SNOW BUNTING.

Only mentioned once, apparently as rare as it is today.
1803. January 9. *Emberiza nivalis.*

Melospiza melodia melodia. SONG SPARROW.

The following appear to refer to this species:
1803. February 12. Sparrows sing (*Fringilla rufa*).
March 3. Sparrows sing.
1804. Red Sparrow arrived [possibly = Fox Sparrows].
1818. January 17. *F. melodus.*
February 5. Song Sparrow sings.
May 18. Young Song Sparrows.

Melospiza georgiana. SWAMP SPARROW.

1802. May 3. Marsh Sparrow (*Fringilla palustris*) arived.
I am not at all sure that this refers to our Swamp Sparrow. Bartram's knowledge of the species of Sparrows was evidently limited, until after the appearance of Wilson's 'Ornithology.'

Spizella passerina passerina. CHIPPING SPARROW.

Curiously enough there are very few records of this common species. They are as follows:
1818. April 22. Domestic Sparrow lays eggs.
1820. March 16. Chipping Sparrow arrived a week past.
April 11. House Sparrow building its nest.

Zonotrichia albicollis albicollis. WHITE-THROATED SPARROW.

Recorded as '*Fringilla albicollis*' on Jan. 9, 1803, Jan. 2 and 17, 1818.
On May 1, 1819 is the entry 'White-throat Sparrow disappeared, gone on to the north to breed' and on April 13, 1822 'White-throat Sparrow is bound northerly'.

Junco hyemalis hyemalis. JUNCO.

Referred to as 'Snow bird' or '*Fringilla hyemalis*' and mentioned in winter lists on Jan. 6, 1802; Jan. 9, 1803; Jan. 24, 1814; and Jan. 17, 1818.

On February 8, 1803 we find 'Snowbirds begin to associate, meditating their departure for the north,' and again on March 11, 1803, 'Snowbirds and other sparrows assemble meditating their journey to the north.'

Dates of arrival in autumn are as follows, all quite late as compared with our recent records:

1803.	October 22.	1819.	October 20.
1805.	October 28.	1820.	October 25.
1806.	October 29.	1821.	October 30.

Pipilo erythrophthalmus erythrophthalmus. TOWHEE.

No bird mentioned in the Journal is referred to by as many names as is the Towhee. Two or three times the technical name is attempted with such results as '*Fringilla erythropalma*' or '*F. eriopthalma,*' while the vernacular names are variously spelled, 'Towhee' 'Towe Bird,' 'Towhee bunting;' 'Chewink,' 'Tewink,' 'Tiewink,' and 'Ground Robin.'

Dates of arrival are:

1802.	April 19.	1818.	May 2.
1803.	April 15.	1819.	April 18.
1804.	April 14.	1821.	April 24.

In autumn the 'Tewink' is recorded as 'yet with us':

1803.	October 22.	1818.	November 20.
1804.	October 3.	1819.	October 8.
1805.	October 25.	1820.	October 17.

There were several years when individual birds wintered in the garden as we find the following:

1806. January 18. Saw a Tewink in a sheltered situation Very cold, 10° above zero.

The next winter a bird is reported on Dec. 24, 1806, Jan. 16, 20, 22 and 27, 1807.

In 1820 we find: 'December 28. Towhee bird (*Fringilla eriopthalma*). Began to snow, now five inches on the earth,' but on January 2, in spite of the snow he was 'yet with us' and on May 13 following we read 'Towhe bunting building its nest in the garden.'

Passerina cyanea. INDIGO BIRD.

Always referred to as the 'Blue Linnet' with '*Emberiza Cyanea*' added one one occasion.

Arrival dates are as follows:

1802.	May 7.	1819.	May 8.
1804.	May 8.	1820.	May 9.
1807.	May 6.	1821.	May 12.
1818.	May 8.	1822.	May 3.

Autumn dates when the species was still present are:

1803.	October 2.	1818.	September 3.
1804.	October 3.	1819.	September 18.

The late singing of the Indigobird is noted on August 3, 1803 when we find the note 'Birds cease singing, except Blue Linnet & some other species of *Fringilla*'; and on July 24, 1804 and August 7, 1818 when 'Blue Linnet yet gives us short songs.'

Cardinalis cardinalis cardinalis. CARDINAL.

The Cardinal is frequently mentioned in winter lists and its whistling is noted.

1803. January 3, 9, 22 and 28. Redbird.
January 19. *Loxia cardinalis.* March 12. Redbird.
1805. February 2. Redbird whistles.
1806. April 5. Redbird sings.
1807. April 11. Redbird.
1818. January 17. *Loxia cardinalis.*
April 12. Redbird whistles.
1820. March 17. *Loxia cardinalis* sings.
1822. May 8. Cardinal redbird.

Spiza americana. DICKCISSEL.

This bird now long absent from the Delaware valley appears to have been of regular occurrence in Bartram's time. We find the following records:

1802. May 3. May Bird (*Alauda calandra*) arrived.
1818. May 13. May Bird (*Calandra*).
1819. May 5. Maybird.
1820. May 7. Maybird (*Calandra*).

Piranga erythromelas. SCARLET TANAGER.

Bartram always refers to this species as the 'Summer Redbird.' Its arrival is recorded five times:

1803. May 7.
1804. May 7.
1808. April 25.
1819. May 6.
1822. April 23.

Piranga rubra rubra. SUMMER TANAGER.

The 'Sandhill Redbird' which was of frequent occurrence in New Jersey in Bartram's time, was apparently always rare on the western side of the river. It is recorded but once in the diary, on May 10, 1818.

Ampelis cedrorum. CEDAR WAXWING.

Mentioned mainly in winter, probably because its occurrence at this time was considered more noteworthy than in summer.

1802. March 2. Flocks of Cedarbirds.
December 22. Ampelis feeding on fruit of Celtis, Juniperus and Diospyros.

1803. January 9. Ampelis. March 11 Cedar Bird appears.
1807. January 19. and 1818 January 29, Cedarbirds.
1820. May 16. Ampelis feeding on blossoms of double flowering Cherry.
1821. January 2. Ampelis feeding on berries of Euonymus atropurpureus.
1821. January. 12 and 1822. January 23, 26, 29 Cedarbirds.

Progne subis subis. PURPLE MARTIN.

1804. August 19. Purple Martin yet with us.
1805. April 4. *Hirundo purpurea* arrived.
1807. April 11. Martin arrived.
1821. April 25. Purple Martin.

Riparia riparia. BANK SWALLOW.

Usually recorded as 'Bank Martin' but a few records of 'Martin' seem to refer to this species rather than to the preceding, of this however I am not positive.

1802. March 24. Flights of Bank Martin passing northerly (*Hyrundo troglodítus*).
1803. March 30, 31, and April 3. Bank Martin passing northerly all day.
September 29. Bank Martin passing daily in large flights southerly.
1804. April 8. Flights of Martin.
October 5 and 9. Flights of Bank Martin passing southerly.

Later dates of arrival are:

1805.	March 26.	1818.	April 8.
1806.	March 31.	1819.	April 12.
1807.	March 24.	1820.	April 13.
1808.	March 31.	1821.	April 25.

Hirundo erythrogastra. BARN SWALLOW.

Referred to as 'Barn Swallow' or 'House Swallow' and once as *Hirundo domestica*. Dates of arrival are:

1802.	April 7.	1807.	April 11.
1803.	April 1.	1818.	April 15.
1804.	April 8.	1819.	April 17.
1805.	April 4.	1820.	April 13.
1806.	April 10.	1822.	April 11.

Autumn records of 'yet with us':

1803.	September 29.	1818.	September 12.
1804.	August 19.	1819.	September 12.
1806.	August 18.	1821.	August 24.

Lanius borealis. NORTHERN SHRIKE.

Always recorded as 'Butcher Bird.'
1802. December 11, 13, 18 and 31.
1803. January 11. 1822. February 3.

Vireosylva olivacea. RED-EYED VIREO?

The following probably refer to this species.
1802. April 26. Little Olive Coloured Warbler (Motasilla olivacea).
1803. May 1. Olive Flycatcher arrived.
1808. April 25. Olive col^{d} Ran.

Vireosylva gilva gilva. WARBLING VIREO.

1818. April 27. Warbling Ren.
September 3. Warbling Flycatcher yet with us.
1820. April 26. Warbling Flycatcher.

Vireo griseus griseus. WHITE-EYED VIREO.

1821. May 13. Whip-tom-Kelly building its nest in the garden.

Dendroica aestiva aestiva. YELLOW WARBLER.

Recorded as 'Summer Yellow Bird' sometimes with '*Motasilla estivalis*' or '*M. estivans*' added. Arrived:

1802.	April 21.	1808.	April 21.
1803.	April 22.	1818.	April 27.
1804.	April 18.	1819.	April 24.
1806.	April 23.	1820.	April 24.
1807.	April 20.	1821.	April 25.

Dendroica coronata. MYRTLE WARBLER.

Always referred to as 'Yellow-rump' sometimes with *Parus virginianus* added. Arrived:

1803.	October 2.	1818.	October 8.
1804.	October 3.	1819.	October 8.

Frequently recorded in winter 'feeding on the Cedar berries,' 1802, December 13, 15; 1803, January 15, 19, 22, March 11; 1804, December 22; 1805, January 19; 1806, December 16; 1807, January 10, 17, 19, 1818, January 2; 1820, April 15.

Geothlypis trichas trichas. MARYLAND YELLOW-THROAT.

Arrived:

1802.	April 26.	1820.	April 23.
1803.	May 3.		

Icteria virens virens. YELLOW-BREASTED CHAT.

Arrived:

1802. May 4.	1820. May 8.
1803. May 3.	1821. May 10.
1807. May 6.	1822. May 9.
1819. May 14.	

Seiurus aurocapillus. OVEN-BIRD.

This bird is referred to by a variety of names as seen in the records of arrival; viz:

1802. April 19. Least Wood Thrush (*Turdus trogloditus*).
1805. April 22. *Turdus trogloditus.*
1808. April 25. *Turdus trogloditus.*
1818. May 10. Little Yellow-crested or Ground Thrush.
1819. April 25. Turdus cristatus, Least golden-crowned Thrush.

Setophaga ruticilla. REDSTART.

Arrived:

1802. May 2.	1819. May 4.
1805. April 18.	1820. April 24.

Anthus rubescens. PIPIT.

1803. March 7. *Alauda migratoria.*

Toxostoma rufum. BROWN THRASHER.

The Thrasher is referred to as 'Fox-coloured Thrush', 'Red Thrush', 'Red-brown Thrush', 'Brown Thrush', 'Great Brown Thrush' or simply 'Thrush'; the second and last being used most frequently. The technical name '*Turdus rufus*' is often added.

The dates of arrival are:

1802. April 11.	1818. April 17.
1803. April 11.	1819. April 7.
1804. April 17.	1820. April 15.
1805. April 9.	1821. April 24.
1807. April 21.	1822. April 19.

It is recorded as 'yet with us':

1803. October 8.	1806. October 29.
1804. October 3.	1818. November 20.
1805. October 9.	1819. October 8.

Dumetella carolinensis. CATBIRD.

Once the generic term '*Lucar*' is added to the vernacular name.

Dates of arrival are:

1802.	April 22.	1818.	May 2.
1803.	April 24.	1819.	April 30.
1805.	April 22.	1820.	April 27.
1808.	April 24.	1822.	April 24.

Latest autumn records are:

1803.	October 8.	1818.	October 8.
1804.	October 14.	1819.	October 8.
1805.	November 6.	1820.	October 12.
1806.	October 7.		

Other entries are:

1804. July 24. Catbird yet gives us short songs.
1807. July 16. Catbird ceases singing.
1818. August 4. Catbird done moulting.
1820. January 8. Was surprised at hearing the voice of the Catbird in the garden.
January 9. The Catbird feeding on the berries of *Sideroxylon.*
January 10. Tempestuous, toward evening began to snow which soon covered the ground. Catbird yet in the garden.

Mimus polyglottos polyglottos. MOCKINGBIRD.

This bird now only an accidental straggler in eastern Pennsylvania was apparently of regular occurrence at the time the journal was written. The references to it are given in full.

1802. January 5. Mocking Bird (*Turdus polyglottos*) not yet left us on his passage to the south.
December 2. Mocking Bird yet with us.
December 4, 13, 15, 20. Mock Bird.
1803. January 19, 22. Mock Bird.
October 29. Mockbird on his passage southerly.
November 8. Mockbird yet with us, being northern passengers on their journey southward, feeding on Smilax &c.
November 18, December 10, 26, 31. Mockbird yet.
1804. January 1, 3, 6. Mockbird. [very cold weather then ensued].
November 2. Mockingbird with us on his passage southerly.
1820. April 18. Mockingbird arrives from the south, caught a male one in a trap-cage bated with a female one.
April 20. Caught another Mockingbird in trap-cage.

Thryothorus ludovicianus ludovicianus. CAROLINA WREN.

In the earlier records this bird is called the 'Great Yellow-throated' or 'Great Yellow-breasted Wren' but in 1820 it is the 'Great Carolina Wren'.

1804. September 11. Many kinds of small birds on their passage southward particularly the Great Yellow-throated Wren and species of *Motacilla*.

It is then recorded on a number of days through November and December until January 31, 1805. There is no other record until March 27, 1820.

Traglodytes aëdon aëdon. HOUSE WREN.

Once called, 'Garden Ren' (*Motasilla familiaris*) otherwise 'House Wren' or 'Ren'.

Arrived:

1802.	April 21.	1819.	April 18.
1805.	April 20.	1820.	April 15.
1806.	April 20.	1821.	April 24.
1807.	April 21.	1822.	April 18.
1818.	April 22.		

Two autumn dates are given when the species was 'yet with us':

1804.	September 26.	1819.	September 19.

Nannus hiemalis hiemalis. WINTER WREN.

1814. February 7. Little Winter Wren.
1818. January 17. *C[erthia] migratoria.* Little Winter Wren.
November 10. Winter Wren arrived from the north.
1819. January 1. Winter Wren.

Certhia familiaris americana. BROWN CREEPER.

This bird is referred to by the name 'Pine Creeper,' once with the name '*Parus pinus*' added and once '*Certhia caudacuta*'.

1802.	April 19, arrived.	1818.	October 8 arrived.
1818.	February 28.	1819.	October 9 "
1819.	April 18 arrived.		

Bæolophus bicolor. TUFTED TITMOUSE.

1802. January 6. *Parus cristatus.*
1804. February 12. Titmouse sings.
1818. January 17. Parus bicolor.

Penthestes atricapillus atricapillus. BLACK-CAPPED CHICKADEE.

1802. January 6. Parus atricapillus.
1818. January 17. P. atricapillus.
1821. September 11. Black-cap approaches our dwelling with his lively, cheerful, notes; reminds us of winter coming.

Sitta canadensis. RED-BREASTED NUTHATCH.

Recorded as *Sitta canadensis* on January 6, 1802 and January 17, 1818.

Sitta carolinensis carolinensis. WHITE-BREASTED NUTHATCH.

Sitta atricapilla is recorded January 17, 1818.

Polioptila cærulea cærulea. BLUE-GRAY GNATCATCHER.

Referred to as 'Little Grey Flycatcher', 'Blue-grey Flycatcher', 'Little Gray Squeeling Flycatcher' and '*Motacilla grisea*'.

Although excessively rare today about Philadelphia it seems to have been of regular occurrence a century ago.

Arrived:

1802.	April 2.	1819.	April 18.
1804.	April 13.	1820.	April 15.
1805.	April 4.	1821.	April 24.
1806.	April 1.	1822.	April 19.
1807.	April 20.		

Regulus satrapa satrapa. GOLDEN-CROWNED KINGLET.

In almost every instance Bartram records both the "Golden and Ruby-crown Wren" together. The winter records certainly do not apply to the latter and whether the dates of arrival apply to one or both it is impossible to say.

Arrivals:

1804.	September 30.	1820.	October 18.
1818.	November 10.	1821.	October 4.
1819.	October 7.		

Winter records are January 6 and December 31, 1802; January 11, 1803; January 2, 1818; January 5, 6 and February 1, 1819.

Hylocichla mustelina. WOOD THRUSH.

Called 'Wood Thrush,' 'Wood Robbin,' 'Song Thrush,' and '*Turdus minor*.'

Arrived:

1803.	May 2.		
1807.	April 26.	1820.	May 8.
1808.	April 27.	1821.	May 5.
1818.	May 9.	1822.	April 26.
1819.	April 18.		

An arrival date, April 12, 1802, must refer to the Hermit Thrush while autumn dates September 29, 1803, November 20, 1818 and October 3, 1819 are of doubtful application.

Planesticus migratorius migratorius. ROBIN.

No species is more frequently recorded: always as 'Robbin' occasionally with the addition of '*Turdus migratorius.*'

Every winter they occurred in flocks feeding on fruits of Celtis, Red Cedar. 'Pasimmons' and once on frozen apples thawed on the trees.'

1802. January 6 and December 15.
1803. January 9, 11, 15, 19, 26. February 5, 7.
February 8. Sings.
February 20. Seeks his mate.
April 5, build their nest.
December 10. yet with us.
1804. January 6, 12, 16 (large flights seem to be on their passage south), 27, February 8, March 1.
October 3 flights from the north.
1805. January 13, 18, February 2 large flights.
March 18 pair and begin building their nest.
1806. December 16, 19 large flights.
1807. January 4, 10, 17, 19.
1808. March 9 Robbin sings.
1818. January 17, 19.
February 28 Robbin sings.
April 3 builds nest.
September 7 flights from the north.
1819. March 5. Robbins arrive.
1820. December 10, 15, 19, 26 large flights.
1821. January 3, 12, 14, 15, 16, 17, 18.
January 19, 20 but few seen.
January 21. Robbins yet in plenty. Three inches of snow.
January 30. Robbins. [On the 25th the temperature was 8° below zero and on the 29th "the ice on the Schuylkill is 12–14 inches in thickness and the Delaware so strong opposite the city affording a constant and safe intercourse with New Jersey on the ice. Carts and Sleds constantly passing loaded with wood, hay &c. Many teams drawn by six horses]
1822. January 4, 16, 23, 25, 26, 29. February 3, 7, 10, 13, 22.

Sialia sialis sialis. BLUEBIRD.

Present throughout the winter months, and often recorded singing in January, and feeding on berries of *Prinos verticillatus*, *Celtis*, *Euonymus* and Red Cedar.

Nesting dates etc.

1802. March 15. Build their nests.
1803. February 20. Bluebird seeks his mate.
March 6. Bluebirds pair.

April 5. Building their nest.
May 12. Brought out their young.
1804. May 18. Bro't out their brood.
1805. March 18. Pair and begin building their nest.
May 18. Bro't out their young brood.
1808. March 9. Bluebirds pair.
1818. April 3. Building their nest.
April 22. Bluebird lays eggs.
May 18. Young Bluebirds.
1819. May 7. Bluebird brought out their first brood which are under protection of the father whilst the hen is laying for the next family.
1820. March 16. Building nest.

COMPARISON OF MIGRATION DATA WITH RECENT RECORDS.

The thought that will naturally occur to anyone who has read the foregoing record is: How do Bartram's dates of arrival compare with those of a century later?

I have called attention elsewhere to the difficulty of securing results of value by comparing individual migration records.[1] By comparing dates of first arrival we may have in one instance a very early straggler and in another the beginning of the main flight, records which are really not comparable at all. Furthermore I have shown that the average dates of arrival for a number of years will differ materially in the records of equally good observers situated only a few miles apart, owing to the fact that the first migrants of a given species may be present for some days in one neighborhood before any are seen in a nearby locality.

For this reason it seems to me that reliable results can only be obtained by combining the records of a number of observers clustered around a given center and selecting as a date for comparison the day upon which the species has reached a majority of the stations, dropping off a definite proportion of obviously late records under each species.

The Delaware Valley Ornithological Club has had for twelve years a corps of from 20 to 35 observers recording migration immediately about Philadelphia and the results of their work is published annually in 'Cassinia.'

[1] Proc. Acad. Nat. Sci. Phila. 1908, p. 134.

I have computed the average of the earliest arrival date furnished by any of these observers for each year, and also a 'bulk arrival' date as explained above, for comparison with Bartram's average date of arrival for 1802–1822, and the three sets of dates are given in the accompanying table.

We should expect most of the dates of any single observer of our corps to fall between the two dates given and in sixteen cases Bartram's dates do so, indicating that there has been no change in the time of arrival during a century. In four cases they are later than the date of 'bulk' arrival — Kingfisher 5 days, Chimney Swift 9 days, Bobolink 1 day, Towhee 1 day.— The Kingfisher is an irregular species often wintering here while Bartram's dates for the Chimney Swift are in all probability inaccurate since Barton (see below) gives April 23 which agrees well with our recent records.

Five species on Bartram's list are earlier than our average first arrival — Hummingbird 3 days, Orchard Oriole 4 days, Baltimore Oriole 1 day, Red-eyed Vireo 3 days, Yellow Warbler 2 days.— Of these the Vireo is probably too early as Bartram did not know either the Solitary or Yellow-throated Vireos and may have confused them with it. For the Yellow Warbler his location was peculiarly favorable while for the Hummingbird and Orchard Oriole the recent records are not so full as might be and the dates computed are probably late.

Prof. W. W. Cooke[1] has recently made a comparison of the dates of arrival given by Dr. Benjamin Smith Barton in his 'Fragments of Natural History' for 1799, with his own computations from the recent records of the U. S. Department of Agriculture for the vicinity of Philadelphia. It is interesting to compare these dates with those just given as Barton's observations and Bartram's were undoubtedly made in almost the same spot. We find that in fifteen species which occur in both lists, the date of arrival is the same in only one. In seven cases Bartram's dates are later than Barton's by from one to nine days (average five days); while in seven cases they are earlier by from two to seven days (average four days).

Prof. Cooke's computed dates for arrival at Philadelphia for

[1] 'Cassinia', 1912, p. 7.

these fifteen species agree with the average date of first arrival that I have computed from the Delaware Valley Club's records in but one instance. In eight cases they are earlier than mine by from one to four days (average two days), while in six cases they are later by from one to three days (average two days). These facts seem to demonstrate pretty conclusively the futility of figuring closely on comparisons of observations of single individuals or upon 'first arrival' records of any sort. At the same time I think that from a study of the accompanying table we are justified in saying that no appreciable change in the time of arrival of these birds has taken place in the past century.

	Bartram 1802–1821	D. V. O. C. 1901–1912	
	Average Date of First Arrival	Average Date of First Arrival	Average Date of 'Bulk Arrival'
Spotted Sandpiper	April 18	April 16	April 27
Killdeer Plover	Feb. 28	February 27	March 11
Kingfisher	April 3	March 13	March 29
Chimney Swift	May 2	April 18	April 23
Hummingbird	April 30	May 3	May 10
Kingbird	May 1	April 29	May 5
Phœbe	March 14	March 11	March 21
Bobolink	May 10	May 4	May 9
Red-winged Blackbird	Feb. 18	Feb. 28	March 9
Orchard Oriole	April 27	May 1	May 6
Baltimore Oriole	April 30	May 1	May 5
Purple Grackle	Feb. 28	Feb. 22	Feb. 28
Towhee	April 20	April 5	April 19
Indigo bird	May 8	May 3	May 8
Scarlet Tanager	May 1	May 1	May 6
Barn Swallow	April 10	April 10	April 23
Red-eyed Vireo	April 28	May 1	May 7
Yellow Warbler	April 23	April 25	April 30
Maryland Yellow-throat	April 27	April 23	April 28
Yellow-breasted Chat	May 8	May 2	May 8
Ovenbird	April 23	April 25	April 30
Redstart	April 27	April 27	May 4
Brown Thrasher	April 15	April 14	April 23
Catbird	April 26	April 24	April 30
House Wren	April 20	April 20	April 26
Wood Thrush	April 29	April 24	April 30

CONCERNING THE FLIGHT OF GULLS.

BY ALEXANDER FORBES.

MR. WILLIAM BREWSTER has recently published in this journal[1] a most interesting and important account of the soaring of gulls to windward. His account is especially valuable since his observations were made with such care and accuracy that no room is left for doubt that the birds soared for long distances horizontally against a strong wind in the neighborhood of a steamer, without the aid of wing beats. The phenomenon is of such interest from the standpoint of physics that it seems to me to warrant further discussion.

The essential features of his observations are briefly as follows:— The steamship on which Mr. Brewster travelled was steaming at a rate of about fifteen knots an hour, with a wind at first blowing at a rate of about twenty miles an hour from about two points off the port bow, and later freshening to a gale of about thirty-five miles an hour and shifting somewhat more nearly dead ahead. Under these conditions a large number of gulls accompanying the ship glided the greater part of the time on set wings; at first flapping their wings at fairly frequent intervals, but, as the wind freshened, less and less frequently until at the height of the gale most of the birds could be seen to glide "over distances certainly exceeding a mile, without a single wing beat." He says of them when gliding: "their respective positions in relation to each other and to the ship were so accurately and systematically maintained that whenever I got one of them in line with any fixed object on the deck I could often hold it there, without myself moving again, for several successive minutes." Thus it is clear that their motion was horizontal not downward, and that its continuance with unabated speed eliminates the possibility of explaining it as the result of momentum acquired in a previous downward swoop, or from previous wing beats.

The distribution of birds in relation to the ship was as follows:— "A few followed the creamy wake of the ship or poised directly over her just to the rear of her smoke-stack but the majority kept

[1] 'The Auk,' Jan., 1912, p. 85.

abreast of her to the windward side, the somewhat sheltered lee side being persistently avoided. On a level with her upper deck or a little above it, they were generally and rather evenly distributed — although more thickly in places than in others — all the way from her stern to amidships, some keeping within a yard or two of the rail, others thrice that distance off, still others fifty or more yards out over the water." He also occasionally saw "one of them leave the rest, and, going two feet to their one, forge ahead of them all perhaps to the bows of the steamer and beyond, yet without once beating its wings."

Mr. Brewster notes that when the birds soared during the height of the gale their wings were held back and with a "downward trend of the flight quills." He suggests that "the wind constantly fills the concave wings of the gliding gulls much as it does the sails of close-hauled vessels and with similar results but with this essential difference: that whereas its force is exerted for the most part laterally on the vessels' sails and opposed by the side thrust of their keels or centreboards in the water, it must have chiefly a lifting effect on the wings of the gulls and be counteracted by the weight of their bodies bearing downward. Hence we may infer that in the case of these birds forward movement is the resultant of two component forces, that of wind and of the attraction of gravitation." He then refers to an article by G. F. Tydeman in which by "extensive use of abstruse mathematical calculations" the phenomenon is analysed. Mr. Brewster then says that he dissents from Tydeman's conclusion "that birds gliding to windward depend for means of propulsion largely if not wholly on uplift afforded by powerful ascending currents of air such as must always rise above a vessel when heavy wind is striking against and deflected from, her sides." He says that for a time he favorably considered this view, adding:— "But I dismissed it altogether from my mind after repeatedly seeing birds hundreds of yards behind the steamer, or fifty or more yards to one side (always the windward one) of her, or even well in advance of her, gliding on set wings in precisely the same manner and quite as ceaselessly as those which hung about her flanks. It seems inconceivable that her presence or movement could have caused vertically rising currents of air to be regularly maintained at such distances from her as those just mentioned, or that they

could have been thus constantly and generally maintained by other influences when the ocean all about her was swept by a wind blowing over thirty-five miles an hour. I even doubt if they extended much above her upper deck for there I was lashed incessantly in the face by what seemed to be horizontally-racing wind, while several of the gulls were often sailing fifteen or twenty feet higher still, perhaps directly over me. On the other hand it must be admitted that I have never known any of these birds to glide far to windward except when accompanying a steamship, a fact which apparently lends some support to Mr. Tydeman's contention, although not necessarily having such significance since it may reasonably be interpreted in other ways."

With the data so thoroughly determined the problem resolves itself into one of comparatively elementary physics. I have not seen Tydeman's article, but I believe that without his abstruse calculations it is possible by reasoning which is within the reach of those untrained in higher mathematics to show that the phenomenon of horizontal gliding could not be produced in the way Mr. Brewster suggests.

Let us assume for the present that the wind is blowing horizontally and uniformly, that the air is an evenly moving mass without local distortions. Then to a bird surrounded by the moving mass it is as if the air were still and the earth's surface travelling by underneath. The bird will tend to drift freely with the wind and will feel no more pressure from it than from the surrounding air in a flat calm. The case of a bird in contact with only one medium moving uniformly is wholly different from that of a boat in contact with two media, air and water. The tendency of the water to prevent free drifting with the wind is the sole cause of the wind's pressure on the boat as long as the air moves uniformly. The bird can only feel pressure from the surrounding air in case of a sudden alteration in the speed or direction of the wind, or in case of motion through the air imparted by gravity or by the bird's own efforts.

The problem of gliding can best be considered by regarding the bird as in a calm and analysing its possible motions with respect to the surrounding air regardless of the earth beneath. After this analysis we may introduce the relative motion between air and

earth. Suppose, then, a bird in still air: in what directions can he glide without wing beats? Motion in any direction will be met by friction from the air. To overcome this, energy must be expended. This may be supplied by muscular action through the bird's wing beats, or by gravity. In the present case we have eliminated wing beats as we are dealing with gliding on set wings, and the only possible source of energy which remains to drive the bird is gravity. Gravity can only work effectively by inducing motion in a direction with a downward component; in a direction which satisfies its demands, so to speak, by bringing the object downward. The direction may deviate from the horizontal by ever so slight a slope, but it must have some downward component. For a bird with nothing but the resistance of his wing expanse to keep him from falling there must be a considerable downward component, especially if the gliding is to be rapid. The only case in which the energy imparted by gravity can carry a bird in still air in a direction without a downward component is when the bird soars for a short distance horizontally or even upwards with the momentum acquired in a previous downward swoop. This case is clearly ruled out of the present problem. Now the horizontal movement of the atmosphere in a wind without ascending currents or other irregularities does not alter the case of still air except in that the bird tends to be carried horizontally with the wind, and consequently must glide more rapidly through the air if going to windward in order to make headway over the earth's surface. In order to glide faster through the air the downward component of the direction of gliding must be increased.

When analysed in this way I think it is evident that no combination of the forces of a uniform horizontal wind and gravity can drive a soaring bird horizontally to windward. The fundamental difference between the close-hauled sailboat and the soaring bird with downward sloping flight quills may be considered in the following way. If a force is to do work the mass upon which it acts must move in such a way as to yield to the force. When a boat, close-hauled, sails to windward she moves in such a way that the sail is withdrawn from the wind's pressure (Fig. 1). When the gull soars with a horizontal wind bearing against the under surface of the downward sloping wing forward motion will not make the

wing withdraw from the wind's pressure but will do the reverse. The fallacy in the wind-gravity conception lies in likening gravity to a kite string which, unlike gravity, holds the kite from drifting to leeward.

The gull, being a very perfect gliding machine, can soar at a

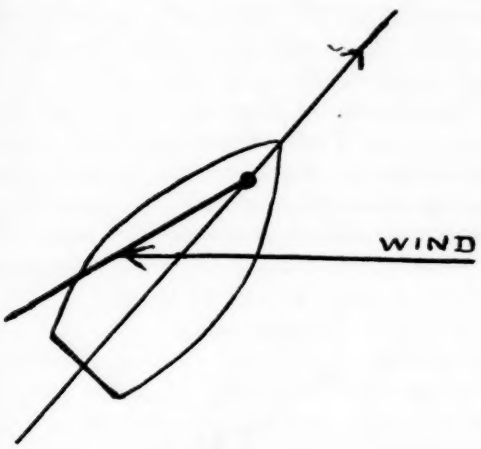


Fig. 1.

comparatively slight downward angle, and in this way can doubtless make head against a strong wind by soaring at a moderate incline. With an upward current of air the possibilities are wholly changed. Through such a current a bird might readily glide downward without descending at all in relation to the earth's surface. The downward motion through the air might suffice to render gravity an effective motive force and yet be so counterbalanced by the ascent of the air that the bird would remain at the same level above the earth. The air current need not rise vertically, but there must be some upward component in its direction, provided its motion be uniform, to make horizontal soaring possible.

The positions about the ship in which Mr. Brewster observed horizontal gliding present such a variety that at first sight it seems difficult to explain the presence of persistent ascending currents in all of them. And yet I believe that reasonable explanations are available in every case. The places noted were, (1) a short dis-

tance in front of the ship, (2) all along the windward side, (3) over the smoke-stack, (4) astern, directly over the wake.

Ascending currents of air must necessarily be produced by a ship steaming to windward, and two distinct causes will be concerned in their production. One is the diversion of the wind from its natural course, both laterally and upwards, by the great mass being forced through it. The other is the column of heated air and smoke rising from the smoke-stack which must cause to rise with it a considerable mass of the surrounding air.

Most of the diversion of the wind by the mass of the ship is probably lateral, but a fair proportion must be upwards. The point where the upward diversion would be most felt would presumably be just above the windward side of the diverting mass. But it would also extend a short distance to windward, for the ship must drive before it a sort of cushion of air suffering compression

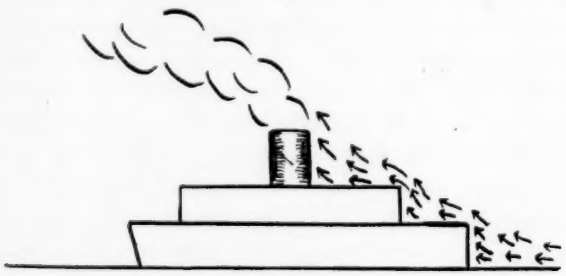


Fig. 2.

from the approaching obstruction. Although the point of maximum upward diversion is presumably just over the weather bow, there is probably an appreciable upward diversion from the propagated obstruction some distance in front and to windward of the ship (Fig. 2).

Mr. Brewster doubted the existence of rising currents where the birds were seen gliding fifteen or twenty feet above the upper deck on which the wind seemed to blow horizontally upon him. I think it is possible, and even probable, that while the wind swept the deck horizontally, it blew with an upward slant twenty feet higher; for in meeting the vertical forward end of the upper deck the air must have undergone some compression which reached a

maximum as the air rounded the corner, to be followed by expansion as it passed over the horizontal surface of the deck. The result of such expansion would be a divergent upward slant in that portion of the air which was at a slight distance from the deck.

On the leeward side of the ship the wind would probably cant downward to form an eddy. If this were so it would readily explain the avoidance of the lee side of the ship by the gulls.

Over the smoke-stack the ascending current must have been powerful, because of the heat. Its presence in the wake of the ship may be explained by the fact that the wind was not dead ahead but from a point and a half to two points off the port bow. As long as the volume of smoke and air poured from the funnel remained at a higher temperature than the surrounding air it must have continued to rise. And since such upward movement tends to be imparted to adjacent air it is probable that for a short distance to windward of the smoke an upward diversion of the wind occurred. With the wind blowing obliquely on the bow any given point in the wake must have been directly to windward of some point in the trail of smoke, namely, that portion of the smoke which was discharged when the boat was at the given point. The birds, although directly in the wake of the steamer, were directly to windward of a large mass of air and smoke, probably still warm and rising vigorously. They may well have been aided in this manner by rising currents for several hundred yards astern of the boat.

I do not claim that these suggestions cover all the factors involved in the explanation of the gliding Mr. Brewster describes. But I contend that the wind must have presented other than uniform horizontal motion to render the feat possible. Ascending currents caused in some of the ways I have suggested seem to me to present the easiest explanation that has occurred to me.

ADDENDUM.

Since writing this discussion my attention has been called to the papers on the subject by Lord Rayleigh, in which he discusses these points so clearly and concisely that my remarks seem almost

superfluous. In the first of these he says at the outset,—"I premise that if we know anything about mechanics it is certain that a bird *without working his wings* cannot, either in still air or in a uniform horizontal wind, maintain his level indefinitely."

This states concisely my main contention. Subsequently he names two possible conditions of continued soaring in other than a downward direction; (1) ascending currents and (2) variations in velocity or direction in different portions of the air. In his discussion he devotes more attention to the second condition, and cites an example of observed flight which seems to exemplify this principle. I scarcely mentioned the possibility of explanation by this latter principle of irregularities in the wind, for though it occurred to me as logically conceivable, it seemed too improbable in the case described by Mr. Brewster to be worth dwelling on.

The references to Lord Rayleigh's papers are as follows:—"The Soaring of Birds." Nature, Vol. XXVII, p. 534. 1883. (Collected Scientific Papers, No. 98, Vol. II, p. 194.)

"The Sailing Flight of the Albatross." Nature, XL, p. 34. 1889. (Coll. Sci. Papers, No. 159. Vol. III, p. 267.)

"The Mechanical Principles of Flight." Manchester Memoirs, Vol. XLIV, p. 1. 1900. (Coll. Sci. Papers, No. 257, Vol. IV, p. 462.)

LIST OF BIRDS COLLECTED IN THE TERRITORY OF QUINTANA ROO, MEXICO, IN THE WINTER AND SPRING OF 1912.

BY JAMES L. PETERS.

DURING the months of January, February, March and April, 1912, I accompanied the expedition of the Peabody Museum of Harvard University as representative of the Museum of Comparative Zoölogy.

My entire time was spent along the Hondo River, collecting on the Mexican side in the newly-formed Territory of Quintana Roo, although Messrs. R. E. Merwin and C. L. Hay, representing the Peabody Museum of American Archaeology and Ethnology made a trip of eleven weeks into the interior, crossing the border into Campeche.

The collection of about 375 skins representing 132 species of birds was made principally at two points along the Hondo River. The camps of the C. C. Mengel and Bro. Co of Louisville, Ky., cutting mahogany on a large concession thirty-six miles from the mouth of the river; known hereafter as Camp Mengel, and at Xcopen a small town about fifteen miles upstream from Camp Mengel.

Besides these two places, we made a short trip to Bacalar, but took few specimens.

With the exception of the week spent on the Bacalar trip, and a month (February 8–March 10) at Xcopen, my time was spent at Camp Mengel where circumstances were particularly favorable for tropical collecting, since a narrow gauge lumber railroad ran thirty miles northwest into the interior. The bush near the camp was rendered easily accessible by many foot paths, while a large *potrero*, clearings, and underbrushed woods all made progress easy and birds more readily approached and recovered.

At Xcopen there was only a muddy mule road and a trail along the river which could be followed. On both sides of these highways was thick jungle which made it both difficult to see and to recover birds.

The type of country covered during the entire four months was all very much the same, which in a way accounts for the comparatively small number of species secured. It may be roughly divided into two types; the river and the bush.

The river type consists of the row of mangroves bordering the river, and the open savannas, covered with water during the rainy season. The bush type is composed of the moist tropical jungle which often joins the river.

Birds typical of the river and open places were several species of Herons, Killdeer, Spotted Sandpiper, Ground Doves (*Chæmepelia rufipennis rufipennis*) Kingfishers, particularly the Texas Kingfisher, Couch's Kingbird, Derby Flycatcher and Fork-tailed Flycatcher.

The more characteristic birds of the bush were the Chachalacas, Parrots, many of species undetermined, Cuckoos (*Piaya cayana thermophila*), Woodhewers, several species of Wrens, Jays (*Psilorhinus*) and Ant Tanagers.

The region is characterized by an almost complete absence of marked topographic features. There are no real hills, but instead a series of low limestone ridges, running north and south becoming higher as one ascends the river. The maximum elevation at Xcopen could not have been much over 200 feet above sea level.

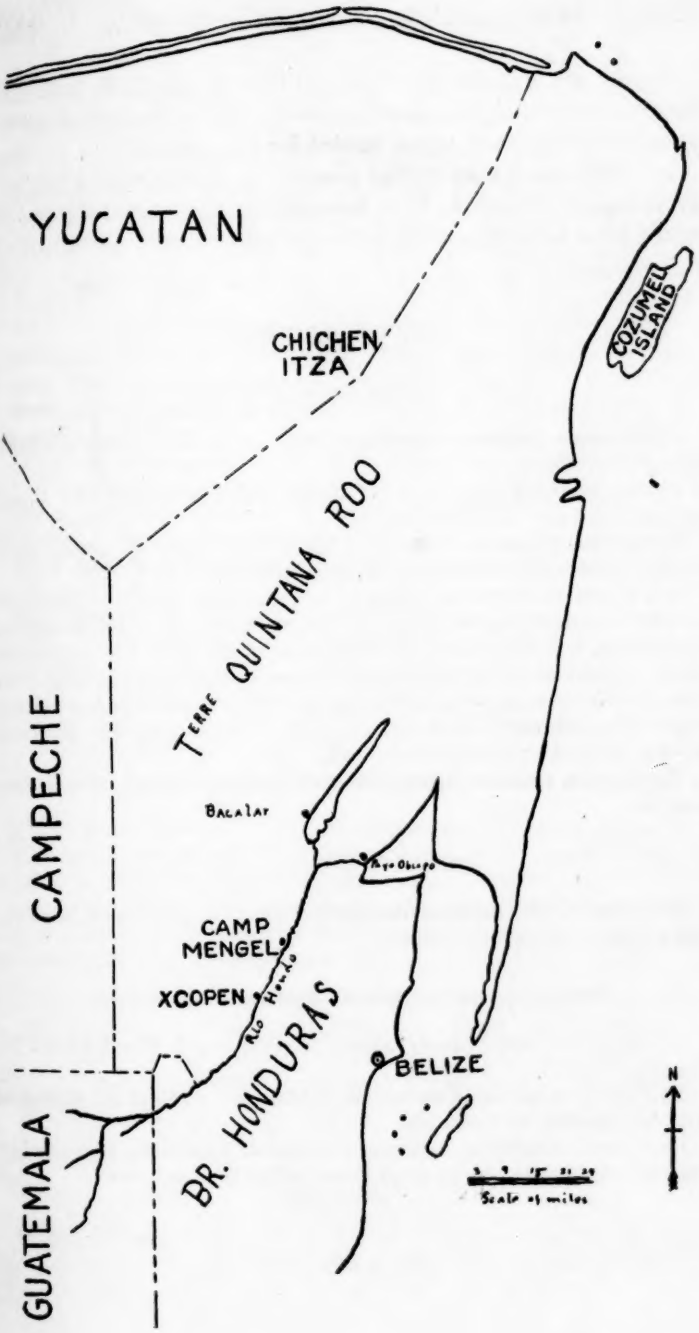
The climate consists of the usual wet and dry season. The former extending from June to November; the latter comprising the rest of the year. Sudden heavy downpours may be expected at most any time during the dry season however.

The temperature during our stay was for the most part quite agreeable, only occasionally going above 90° F. during the day, and seldom exceeding 80°. The coldest night was 49°.

Colors of birds in descriptions are from Ridgway's Nomenclature of Colors, edition of 1886. All measurements are in millimeters.

I wish to extend in heartiest thanks to the Mengel Co. for their generous hospitality and assistance during the long time that I was at their camp.

I also take this opportunity to thank Mr. Outram Bangs of the Museum of Comparative Zoölogy for much valuable advice and assistance, for without his constant aid this list would not have been possible.


YUCATAN
CHICHEN ITZA
COZUMEL ISLAND
TERRE QUINTANA ROO
CAMPECHE
BACALAR
CAMP MENGEL
XCOPEN
Rio Hondo
BELIZE
BR. HONDURAS
GUATEMALA
N
Scale of miles

Thanks are also due to the authorities of the U. S. National Museum and the Bureau of Biological Survey for the loan of specimens, including many types, needed for comparison.

In conclusion I take special pleasure in acknowledging my indebtedness to Mr. C. L. Hay, for without his generous interest it would have been impossible for a zoölogist to have accompanied this expedition.

LIST OF SPECIES.

ARDEIDÆ.

Hydranassa tricolor ruficollis (Gosse). 1, Hondo River near Camp Mengel, January 31.

Florida cærulea (Linn.). 3 ♂, Xcopen, Feb. 10 and March 3. Camp Mengel, April 24.

Butorides virescens virescens (Linn.). 3 ♀, 1 undetermined, Camp Mengel, January 31, February 7; Xcopen, February 18 and 24.

A bird (sex undetermined) taken at Camp Mengel, February 7, exhibits a rather peculiar phase of plumage. Crown, hind neck, auricular region, secondaries, and tail as in normal plumage; feathers of chin and throat dusky, edged with white; feathers of neck dusky with whitish median line; sides of neck rusty; greater, middle and lesser coverts and scapulars broadly edged with dark rusty; back dull greenish; breast dark smoky; abdomen smoky, the feathers edged with dull buff.

Nyctanassa violacea (Linn.). 1 ♂ on river near Camp Mengel, January 21.

FALCONIDÆ.

Accipiter bicolor schistochlamys Hellmayr. 1 ♂, Xcopen, March 3. Iris orange; legs and feet yellow.

Rupornis magnirostris conspecta, new subspecies.

5 both sexes, Camp Mengel, January 16, February 4, March 16 and 26, Xcopen, March 7.

Type from San Ignacio, Yucatan, no. 40,123, adult ♂, M. C. Z. Collected February 9, 1904, by L. J. Cole.

Characters. Similar to *Rupornis magnirostris griseicauda* Ridgway but smaller; much paler (smoke grey) above; slightly paler below.

No.	Sex	Locality	Wing	Tail	Tarsus	Culmen
40123	♂	Yucatan	218 mm.	159 mm.	62 mm.	17.5 mm.
40122	♀	"	231	169	65	18.5
15288*	—	"	228	172	66	18
60748	♂	Terre Quintana Roo	219	159	63	19
60749	♂	" " "	222	159	66	19
60747	♀	" " "	239	169	65	19
60746	♀	" " "	233	159	62	19.5
60745	♀	" " "	225	172	62	18

Of the five specimens collected, one is typical of the new form; the other four are intermediates more or less closely approaching it.

Herpetotheres cachinans (Linnæus). 2 ♂, Santa Lucia, January 22, Camp Mengel, February 4.

Regerinus uncinatus Illiger. 1 ♀, Camp Mengel, April 5. Iris white; lores and cere greenish; legs yellow.

Ictinia plumbea (Gmelin). 2 ♂, Camp Mengel, April 2 and 23. Iris red, bill and cere black, tarsus salmon.

Falco spaverius spaverius Linn. 3, both sexes, Camp Mengel, January 13, 16 and March 31.

Falco albigularis Daudin. 4, both sexes, Xcopen February 22, March 1 and 2, Camp Mengel, March 19. The bird shot March 19, was the ♂ of a pair apparently ready to breed. Iris hazel, cere and legs yellow.

CRACIDÆ.

Ortalis vetula intermedia new subspecies.

3, 1 ♂, 2 undetermined. Camp Mengel, January 20, March 12 and 20.

Type from Camp Mengel, *Terre* Quintana Roo, Mexico, no. 60644, adult ♂ M. C. Z. Collected March 12, 1912, by James L. Peters.

Characters. Similar to *O. v. pallidiventris* Ridg. but darker above; below neck and breast darker; abdomen light isabelline; thighs, flanks and under tail coverts fulvous; five outer pairs of rectrices tipped with isabelline.

No.	Sex	Wing	Tail	Tarsus	Culmen
60644	♂	181 mm.	225 mm.	62.5 mm.	23.5 mm.
60643	—	184	241	59.	26
60645	—	172	215	62.5	22

JACANIDÆ.

Jacana spinosa (Linnæus). A ♀ and one young bird, Xcopen, February 11. Legs grey; base of bill white; shield, bill and spur yellow.

CHARADRIIDÆ.

Oxyechus vociferus vociferus (Linnæus). 2 ♂, Camp Mengel, February 3; Xcopen, February 29.

SCOLOPACIDÆ.

Totanus flavipes (Gmelin). 2 ♂, Xcopen, February 16; Camp Mengel, April 24.

Helodromas solitarius solitarius (Wilson). 1 ♂, Xcopen, February 16.

Actitis macularia (Linnæus). 1 ♂, Camp Mengel, January 31.

COLUMBIDÆ.

Columba nigrirostris nigrirostris Sclater. 1 ♀, 30 miles north of Camp Mengel, April 19.

Melopelia asiatica trudeaui (Audubon). 2 ♀, Camp Mengel, March 16 and 17. Iris orange; skin of face blue, legs and feet carmine.[1]

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[1] **Melopelia asiatica australis**, new subspecies.

Type from Cerro Santa Maria, Costa Rica. No. 21118, adult ♂. Bangs collection, collected January 9, 1908, by C. F. Underwood.

Characters. Similar to *M. a. trudeaui* (Aud.) but back scapulars and tertials a much richer brown (between Prout's brown and raw umber) which becomes less intense on the wing coverts. Upper tail coverts and middle pair of rectrices brown, deeper than the back.

Similar also to *M. a asiatica* (Linn.) in the color of the lower throat, neck, and chest which are brownish-vinaceous, although less intense than in that form.

Bangs Collection.

No.	Sex	Wing	Tail	Tarsus	Culmen
16442	♂	152 mm.	113 mm.	26.5 mm.	21 mm.
21118	♂	158	110.5	23.5	19.5
21119	♀	150	112	22	19
21120	♂	161	110	26	21.5
21121	♀	155	111	24	19
21122	♂	160	112	24.5	18.5
21123	♀	156	113	23	19.5
21124	♂	157	114	22	18.5

All specimens of *Melopelia asiatica* from southern Mexico and Yucatan that I have examined undoubtedly belong to *M. a. trudeaui*. Representatives from Costa Rica, however, differ sufficiently to warrant their separation as a subspecies which may be called.

Chæmepelia rufipennis rufipennis (Bonaparte). 5, both sexes, Camp Mengel, January 16, February 3, April 8. Xcopen, February 26, March 6.

Claravis pretiosa pretiosa (Ferrari-Perez). 2 ♀, Camp Mengel, February 3 and March 30.

STRIGIDÆ.

Strix virgata virgata (Cassin). 1 ♀, Camp Mengel, March 11.

Glaucidium phalænoides ridgwayi (Sharpe). 1 ♀, 15 miles north of Camp Mengel, March 23. Iris yellow; bill whitish.

PSITTACIDÆ.

Conurus aztec (Souancé). 3, both sexes, Camp Mengel, February 6 and March 20. Iris orange.

Pionus senilis (Spix). 2 ♂, Xcopen, February 26, Camp Mengel, April 8. Iris, legs and skin about eye orange.

CUCULIDÆ.

Piaya cayana thermophila Sclater. 6, both sexes, Camp Mengel, January 14, February 4, February 6, March 17; Xcopen, February 14. Iris red.

Crotophaga sulcirostris Swainson. 3, both sexes, Santa Lucia, January 24; Xcopen, February 10, March 4.

CAPRIMULGIDÆ.

Nyctidromus albicollis yucatanensis Nelson. 3, both sexes, Camp Mengel, February 4 and 6, Xcopen, February 21.

ALCEDINIDÆ.

Ceryle alcyon alcyon (Linnæus). 2, both sexes, Camp Mengel, January 21, Xcopen, February 24.

Ceryle torquata torquata (Linnæus). 1 ♀, Camp Mengel, February 7.

Ceryle americana septentrionalis (Sharpe). 6, both sexes, Camp Mengel, January 31, Xcopen, February 24, 26 and March 4.

GALBULIDÆ.

Galbula melanogenia Sclater. 1 ♂, Xcopen, March 4. Iris hazel, legs and feet yellow.

RHAMPHASTIDÆ.

Rhamphastos carinatus Swainson. 1 ♀, Camp Mengel, January 14.

Pteroglossus torquatus erythrozonus Ridgway. 3, both sexes, Camp Mengel, January 16 and 21. Xcopen, February 20. Iris lemon, skin of face red.

Aulacorhamphus prasinus (Lichtenstein). 3 ♂, Camp Mengel, March 11, 19 and 26.

PICIDÆ.

Chloronerpes yucatanensis yucatanensis (Cabot). 3, both sexes, Camp Mengel, March 30, April 1 and 3.

Centurus dubius (Cabot). 8, both sexes, Camp Mengel, January 13; February 1, 4; April 5 and 23. Xcopen, February 20, 28 and 29.

Scapaneus guatemalensis guatemalensis (Hartl.). 2, both sexes, Camp Mengel, January 14 and April 23. Iris lemon.

Ceophlœus leucoramphus (Reichenbach). 1 undetermined, Camp Mengel, March 12.

TROGONIDÆ.

Trogon melanocephalus melanocephalus Gould. 4, both sexes, Santa Lucia, January 23; Xcopen, March 5; Camp Mengel, March 18. Naked eye-ring bluish white.

TROCHILIDÆ.

Amizilis tzactl tzactl (De la Llave). 5, both sexes, Santa Lucia, January 24; Xcopen, February 10–26.

Amizilis cyanocephala (Lesson). 1 undetermined, Camp Mengel, March 16.

DENDROCOLAPTIDÆ.

Dendrocincla anabatina anabatina Sclater. 1 ♀, Camp Mengel, April 5.

Xiphorhynchus flavigaster flavigaster Swainson. 4, both sexes, Camp Mengel, March 19, 24, 28, and April 19.

Xiphorhynchus flavigaster yucatanensis Ridgway. 1 ♂, Camp Mengel, March 19.

Of the five specimens of *Xiphorhynchus flavigaster* collected, four were intermediate between *X. f. flavigaster* and *X. f. yucatanensis*, but apparently nearer to the former; the fifth was taken in the same grove and on the same day only a short distance from another bird also a ♂, which, of all

the intermediates most nearly resembled *X. f. flavigaster*. The fifth bird just referred to is essentially typical of *X. f. yucatanensis* in every respect.

Sittasomus sylvioides sylvioides Lafresnaye. 2, a ♂ and 1 undetermined, Xcopen, February 18 and March 2.

FURNARIIDÆ.

Synallaxis erythrothorax Sclater. 1 ♀, Xcopen, March 1. Iris red.

Xenops genibarbis mexicanus (Sclater). 1 ♀, 30 miles north of Camp Mengel, April 17.

FORMICARIIDÆ.

Formicarius moniliger intermedius Ridgway. 1 ♂, Xcopen, February 19.

Thamnophilus doliatus yucatanensis Ridgway. 6, both sexes, Xcopen, February 11, 13, 22; March 2; Camp Mengel, March 26; April 5. Iris lemon, feet and legs bluish.

COTINGIDÆ.

Tityra semifasciata personata (Jardine & Selby). 4, both sexes, Xcopen, February 28, March 3 and 4; Camp Mengel, March 25. Iris brown, feet and legs lead, base of bill and skin of face red.

Platypsaris aglaiæ sumichrasti Nelson. 1 ♀, Camp Mengel, March 31.

Attila citreopygus salvini Ridgway. 2, a ♂, 1 undetermined. 20 miles north of Bacalar, January 27; Camp Mengel, March 25. Eyes brown; tarus bluish.

PIPRIDÆ.

Manacus candei (Parzudaki). 5, both sexes, Xcopen, February 12, March 5; Camp Mengel, March 31. Legs orange.

TYRANNIDÆ.

Muscivora tyrannus (Linnæus). 4, both sexes, Camp Mengel, January 31; March 15–31.

Tyrannus melancholicus satrapa (Cabanis and Heine). 5, both sexes, Camp Mengel, January 15 and 21; March 11, Xcopen, February 24 and 29.

Pitangus sulphuratus derbianus (Kaup). 4, both sexes, Santa Lucia, January 22; Camp Mengel, February 1; March 15 and 28.

Myiodynastes luteiventris Sclater. 2 ♂, Camp Mengel, April 5 and 23.

Myiarchus lawrenceii lawrenceii (Giraud). 3 ♂, Camp Mengel, February 3 and March 17; Xcopen, March 1.

Myiarchus magister nelsoni Ridgway. 3, 2 ♂, 1 undetermined, Xcopen, March 7; Camp Mengel, March 26, April 7.

Sayornis phœbe (Latham). 1 ♀, Camp Mengel, March 11.

Empidonax minimus (Baird). 5, both sexes. Santa Lucia, January 24; Xcopen, February 17–March 5; Camp Mengel, March 30.

Myiochanes brachytarsus (Sclater). 3 both sexes, Camp Mengel, January 14, February 3 and March 17.

Myiochanes virens (Linnæus). 1 undetermined, 30 miles north of Camp Mengel, April 20.

Myiobius xanthopygus sulphureipygius (Sclater). 1 ♂, 30 miles north of Camp Mengel, April 18.

Pyrocephalus rubinus blatteus Bangs. 3, both sexes, Camp Mengel, January 17 and February 1; Xcopen, February 10.

Description of adult ♀ taken February 10 at Xcopen. Similar in general coloration to adult ♀ of other forms of *P. rubineus*, but the upper parts distinctly tinged with vinaceous, strongest on the head and rump. Abdomen, flanks, thighs and undertail coverts a brilliant scarlet-pink, shading to rose pink on the lower breast and bend of the wing. Wing. 71 mm.; tail 56.3 mm.; tarsus 18.1 mm.; culmen 13.4 mm.

Pipromorpha assimilis assimilis (Sclater). 1 ♀, Xcopen, March 5.

Myiozetetes texensis texensis (Giraud). 4, both sexes, Camp Mengel, February 6, March 31, April 8; Xcopen, February 20.

Legatus albicollis variegatus (Sclater). 1 ♀, Camp Mengel, March 31.

Elænia martinica subpagana (Sclater and Salvin). 2 ♂, Xcopen, February 15; Camp Mengel, March 17.

Rhynchocyclus cinereiceps (Sclater). 2, both sexes, Camp Mengel, March 18 and April 13. Iris greyish white.

Craspedoprion brevirostris (Cabanis). 1 ♀, 30 miles north of Camp Mengel, April 18.

Todirostrum cinereum finitimum Bangs. 2, both sexes, Xcopen, March 2; Camp Mengel, April 9. Iris yellowish, tarsus bluish.

MIMIDÆ.

Mimus gilvus gracilis (Cabanis). 3, both sexes, Camp Mengel, January 20 and March 19.

Dumetella carolinensis (Linnæus). 1 ♂, Xcopen, February 14.

TURDIDÆ.

Planesticus grayi grayi (Bonaparte). 2 both sexes, Camp Mengel, March 31 and April 5.

Hylocichla mustelina (Gmelin). 1 undetermined, Xcopen, March 7

SYLVIIDÆ.

Polioptila superciliaris superciliaris Lawrence. 1 ♀, Camp Mengel, April 6.

TROGLODYTIDÆ.

Nannorchilus leucogaster brachyurus (Lawrence). 2, both sexes, Xcopen, March 4; 30 miles north of Camp Mengel, April 17.

Henicorhina prostheleuca prostheleuca (Sclater). 1 ♂, Camp Mengel, April 3. Iris brown.

Troglodytes musculus hypaëdon (Sclater). 2 ♂, Camp Mengel, March 13 and 19.

Examination of the type and one other specimen of *Troglodytes irrequies* Bangs and Peck, with a series of *T. m. hypaëdon* seems to show that *T. irrequies* is probably not sufficiently distinct to warrant its separation even as a subspecies of *T. m. hypaëdon*.

Pheugopedius maculipectus maculipectus (Lafresnaye). 4, both sexes, Xcopen, February 17, 23, March 8; Camp Mengel, April 3. Iris red brown, tarsus bluish.

CORVIDÆ.

Psilorhinus mexicanus cyanogenys (Sharpe). 4, both sexes, Xcopen, February 25 and 29; Camp Mengel, April 1.

These birds are slightly smaller than *P. m. cyanogenys*, but they lack the much whiter underparts of *P. m. vociferus* (Cabot).

VIREONIDÆ.

Pachysylvia decurtata (Bonaparte). 2 ♂, Camp Mengel, March 18 and 28.

Vireo ochraceus Salvin. 1 ♂, Xcopen, February 20. Iris greyish white.

Vireo griseus griseus (Boddært). 4, both sexes, Xcopen, February 17, 23, March 2; Camp Mengel, March 15.

Vireosylva flavoviridis flavoviridis Cassin. 2 ♂, Camp Mengel, March 28 and April 13.

HIRUNDINIDÆ.

Iridoprocne albilineata (Lawrence). 2, both sexes, Camp Mengel, February 1 and March 11.

Stelgidopteryx serripennis (Audubon). 3, both sexes, Camp Mengel, January 16 and March 13.

Progne chalybea chalybea (Gmelin). 3, both sexes, Xcopen, February 15; Camp Mengel, March 19 and 20.

MNIOTILTIDÆ.

Mniotilta varia (Linnæus). 2 ♂, Camp Mengel, March 25 and April 1.

Helinaia swainsoni Audubon. 1 ♀, Santa Lucia, January 24.

This specimen constitutes the first record for any part of southern Mexico. A ♀ was taken on Swan Island, Caribbean Sea, by George Nelson, March 1, 1912. (Coll. M. C. Z. no. 58195.)

Helmitheros vermivorus (Gmelin). 1 ♀, Xcopen, March 8.

Dendroica æstiva æstiva (Gmelin). 3 ♂, Camp Mengel, January 17 and March 17; Xcopen, February 15.

Dendroica magnolia (Wilson). 9, both sexes: Santa Lucia, January 23; Xcopen, February 12–March 7; Camp Mengel, March 18–April 3.

Dendroica tigrina (Gmelin). 1 ♂, Camp Mengel, March 13. Ridgway (Birds of North and Middle America, Part II, p. 538) gives for Yucatan, "One record only" and none for any other part of Mexico. This bird therefore establishes another record for Mexico.

Dendroica coronata (Linnæus). 3, both sexes, Camp Mengel, January 17–March 25.

Dendroica fusca (Müller). 1 ♂, 30 miles north of Camp Mengel, April 19.

Dendroica dominica albilora Ridgway. 1 ♂, Xcopen, February 28.

Seiurus noveboracencis notabilis Ridgway. 1 ♂, Camp Mengel, April 9.

Geothlypis trichas brachidactyla (Swainson). 8, both sexes; Camp Mengel, January 13–April 7; Xcopen, February 10.

Chamæthlypis poliocephala palpebralis Ridgway. 6, both sexes, Camp Mengel, February 3–April 9.

Icteria virens virens (Linnæus). 1 ♀, Xcopen, February 11.

Wilsonia citrina (Boddært). 2 ♂, Camp Mengel, January 17 and March 26.

Setophaga ruticilla (Linnæus). 4, both sexes: Xcopen, February 16–March 4; Camp Mengel, March 16.

Basileuterus culicivorus culicivorus (Lichtenstein). 1, sex undetermined, Camp Mengel, March 25.

CŒREBIDÆ.

Cyanerpes cyanea carneipes Oberholser. 1 ♂, Camp Mengel, March 30.

ICTERIDÆ.

Gymnostinops montezuma (Lesson). 1 ♀, Camp Mengel, January 14.

Amblycercus holosericeus (Lichtenstein). 3, both sexes, Camp Mengel, January 13; Xcopen, February 17 and 22.

Cassidix oryzivora mexicana (Lesson). 2 ♂, Camp Mengel, March 24.

Tangavius involucratus (Lesson). 7, both sexes: Xcopen, February 10–22; Camp Mengel, April 13.

Dives dives (Lichtenstein). 5, both sexes, Camp Mengel, January 20 and April 8; Xcopen, February 18–22.

Icterus prosthemelas (Strickland). 4, both sexes, Xcopen, February 19 and March 3; Camp Mengel, March 31.

Icterus spurius (Linnæus). 8, both sexes, Payo Obispo, January 29; Xcopen, March 3; Camp Mengel, March 16–April 5.

Icterus gularis yucatanensis Berlepsch. 1 ♂, Camp Mengel, February 6.

Icterus mesomelas mesomelas (Wagler). 4, both sexes, Camp Mengel, January 21–April 23; Xcopen, February 19.

Agelaius phœniceus richmondi Ridgway. 11, both sexes, Camp Mengel, January 16–February 3; March 11–April 13.

These birds were common in a large savanna near Camp Mengel, but were not seen at other points along the river. None of the birds shot showed any sign of breeding, although singing males apart from the flocks were taken from time to time in hopes of securing residents.

TANAGRIDÆ.

Euphonia hirundinacea Bonaparte. 2, both sexes, Camp Mengel, March 16 and April 1.

Euphonia gouldi Sclater. 1 ♀, Camp Mengel, February 6.

Tanagra cana diaconus Lesson. 3, both sexes. Camp Mengel, March 15–17.

Tanagra abbas Lichtenstein. 5, both sexes. Camp Mengel, March 11–April 13.

Piranga rubra rubra (Linnæus). 1 ♀, Xcopen, March 7.

Phlogothraupis sanguinolenta sanguinolenta (Lesson). 4, both sexes, Xcopen, February 17 and 20; Camp Mengel, March 17 and April 23. Iris red brown.

Lanio aurantius Lafresnaye. 1 ♂, 30 miles north of Camp Mengel, April 14.

Phœnicothraupis rubica nelsoni Ridgway. 2, both sexes, Camp Mengel, March 11 and April 20.

Neither of these specimens represents typical *nelsoni;* the male is duller than any representative of this subspecies examined, while the female more nearly resembles *P. r. rubicoides* (Lafr.) particularly in the color of the underparts which are dull ochraceous instead of pale buffy.

Phœnicothraupis salvini salvini Berlepsch. 5, both sexes. Xcopen, February 23–March 7; Camp Mengel, April 3.

FRINGILLIDÆ.

Saltator magnoides magnoides Lafresnaye. 1 ♂, Xcopen, March 8.

Saltator grandis grandis (Lichtenstein). 1 ♀. Xcopen, March 3.

Saltator atriceps raptor (Cabot). 2, both sexes, Camp Mengel, March 24 and April 13.

The Yucatan form of *Saltator atriceps* was originally described by S. Cabot Jr. (Journal Boston Soc. N. H., v, 1844, 90, pl. 12) as *Pyrrula raptor*. It differs from *S. a. atriceps* in having the breast and abdomen much paler gray and the flanks almost lacking any olivaceous wash. The birds average about the same size as *S. a. atriceps*. The constantly lighter color of the underparts of *S. a. raptor* is very striking in the series examined.

Caryothraustes poliogaster poliogaster (Du Bus). 2 ♂, 30 miles north of Camp Mengel, April 20–21.

Cardinalis cardinalis flammiger, new subspecies.

3, both sexes, Xcopen, February 13, March 4 and 8. Type from Xcopen, Territory of Quintana Roo, Mexico, no. 60629 adult ♂ M. C. Z. Collected March 8, 1912, by J. L. Peters.

Characters. Adult ♂ resembling most nearly *C. c. yucatenensis* Ridgway but slightly larger; bill longer, relatively more slender. Color of underparts between geranium red and scarlet vermilion instead of scarlet and scarlet vermilion.

Adult ♀ similar to adult ♀ of *C. c. yucatanensis* except that the back is bistre brown instead of raw umber.

No.	Sex	Wing	Tail	Tarsus	Culmen
60629	♂	85.5 mm.	106.1 mm.	25.5 mm.	18.5 mm.
60630	♀	79.5	96.8	24.5	18.
60631	♀	78.8	102.8	24.5	17.2

Zamelodia ludoviciana (Linnæus). 2, both sexes, Camp Mengel, March 15.

Guiraca cærulea cærulea (Linnæus). 4, both sexes, Xcopen, February 28 and March 8; Camp Mengel, April 1.

Passerina cyanea (Linnæus). 2, both sexes, Camp Mengel, January 13 and March 25.

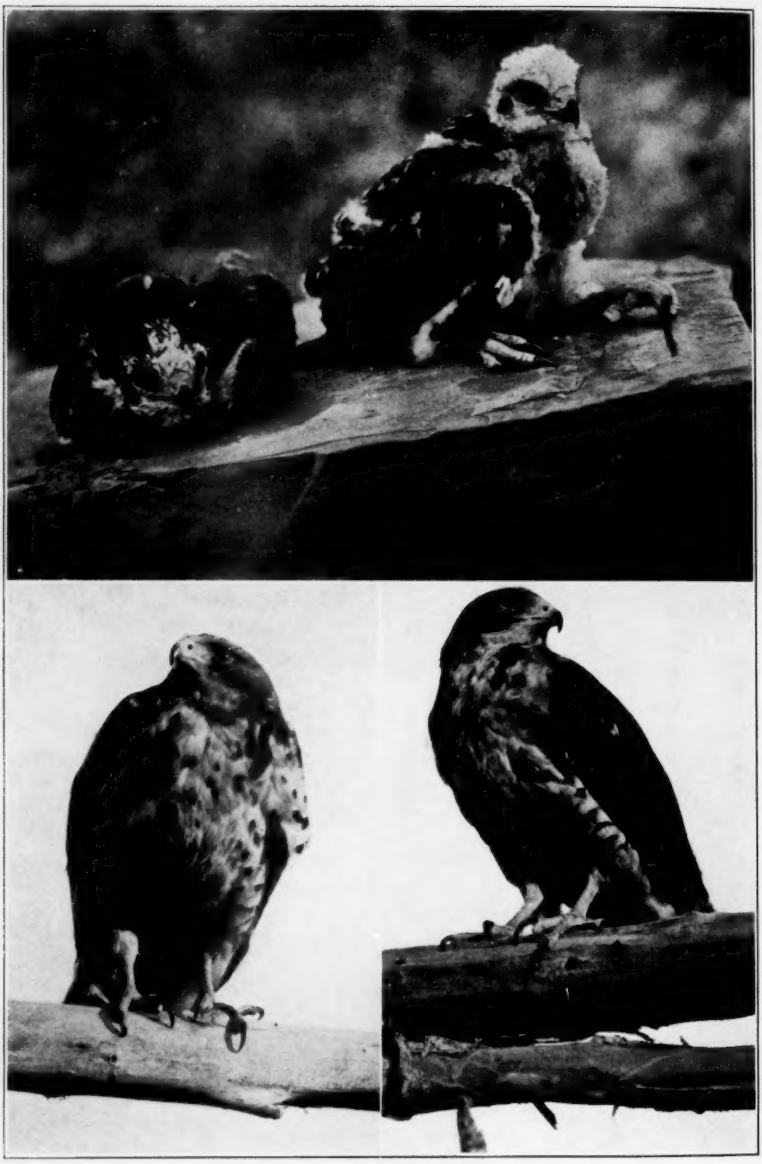
Sporophila morelleti (Bonaparte). 6, both sexes. Camp Mengel, January 13–February 1, March 31; Xcopen, February 12–March 7.

Volatinia jacarini splendens (Vieillot). 4, both sexes, Camp Mengel, February 1–6, April 6–7.

Arremonops chloronotus (Salvin). 4, both sexes, Camp Mengel, January 14; Xcopen, February 14–20.

Melospiza lincolni lincolni (Audubon). 1 ♂, Camp Mengel, January 15.

Spiza americana (Gmelin). 2 ♂, Camp Mengel, April 5.



SWAINSON'S HAWK (*Buteo swainsoni*).

1. Nestlings Three Weeks Old. 2. Eight Months Old. 3. One Year Old.

NOTES ON SWAINSON'S HAWK (*BUTEO SWAINSONI*) IN MONTANA.

BY E. S. CAMERON.

Plates XII and XIII.

II. FOOD.

IN his standard work on 'The Hawks and Owls of the United States' Dr. A. K. Fisher, gives a summary of eighteen stomachs of Swainson's Hawk examined by him as follows: "Seven contained small mammals; eight, insects; three, reptiles; three, batrachians, and three were empty." My own conclusions, from observations made at fourteen nests, are that Swainson's Buzzard prefers frogs, grasshoppers, and mice, in the order named to any other food when it can get them. Grasshoppers form the staple sustenance of these hawks in Montana. In common with all birds, however, the hawk's food habits vary with season and locality, and in spring, when its favorite prey is unobtainable, small birds and cotton-tail rabbits (*Lepus artemisiæ*) are attacked. As regards the former, Lark Buntings (*Calamospiza melanocorys*), which were often exceedingly numerous around the nesting site, are, in my experience, the only species ever taken — the color and soaring habits of the males rendering them peculiarly conspicuous. 'Cotton-tails,' now very scarce owing to an epidemic amongst them, were at one time remarkably abundant, and fell frequent victims to buzzards and Great Horned Owls. One of these small hares, weighing under three pounds, which dart for their nearby holes at lightning speed upon the first alarm, was found in the nest of a Swainson's Hawk, and testified thereby to the venatorial skill of its capturer. In Alaska Mr. Dall found the bones of rabbits, squirrels and ducks in the nest of Swainson's Hawk,[1] but I have never known any prairie dogs, poultry, or game birds, to be taken by it. Constant observation was kept upon a pair of Swainson's Hawks which nested in my vicinity in 1908 and 1909 by my wife,

[1] North American Birds, Vol. III, p. 269.

myself, and the herd-boy above mentioned. The young birds were fed chiefly upon grasshoppers with occasional mice, frogs, and snakes. Whenever my wife or I visited them their crops were crammed with the first named. The herd-boy, who had the best opportunities for observation, as much of his time was spent near the nesting site,— told us that the female continually brought frogs and occasionally snakes. He once saw her seize on the ground, and bear to the eyrie, a Lark Bunting which she captured by stooping from a height like a falcon. At this nest, during the two years which we observed it, the above was (so far as we knew) the only time that the young hawks were regaled with a feathered prey. Unless I actually saw the parents bring food, I could only infer its nature from the excretions and pellets, as nothing edible was ever found in the nest. This was situated upon a creek with many reed fringed, frog-haunted pools, and it was, therefore, natural that next to grasshoppers the amphibians should be the most frequent prey. The more shy male did not bring food so often as his mate (at least when intruders were present), although I once flushed him off the eggs. Swainson's Hawk is a voracious feeder, and on June 27, 1893, I shot a female of this species whose stomach contained an entire Lark Bunting. Even the unfledged young will swallow mice and frogs whole. Like its great cousin, the Golden Eagle, this hawk is very partial to snakes, but sometimes the snake proves too much for its captor, as in the following instance kindly narrated to me (in lit) by Mr. W. R. Felton — a civil engineer for the Chicago, Milwaukee and Puget Sound Railway. On August 31, 1910, his slowly moving freight wagons were winding up a trail by the Little Dry River to another camp site. The instrument man, Mr. M. H. Devine, brought up the rear about a mile behind the van, when his attention was attracted to a large hawk which fell swiftly through space to the ground apparently with a broken wing. His curiosity being excited, he at once walked towards it, but, when about sixty-five yards off the disabled hawk succeeding in rising to a considerable height. As he watched it, to his great surprise, the hawk again fell headlong, this time into the middle of the river, impelled by some mysterious agency. The bird managed to struggle to the bank, and upon being lifted from the water was found to be a Swainson's Hawk with a garter snake

(*Eutaenia sirtalis*) firmly coiled around one wing. Both hawk and snake were unfortunately killed; neither does any harm, and they are useful to destroy the ubiquitous mice. In fact the snake disgorged a partly digested mouse when withdrawn from the water. So tightly did the reptile (which measured twenty-eight inches) encircle the hawk's wing, that it could not be pulled away and had to be gradually unwound. Dr. Holland mentioned to Seebohm an instance in Pomerania of a female buzzard (*Buteo vulgaris*) which represents the American *B. swainsoni*) having been found dead on the nest with a live viper under her.[1]

It has been universally considered by ornithologists that members of the subgenus Buteo never chase birds on the wing, but I believe all buzzards which stoop to a feathered prey will occasionally do so when driven by hunger, or incensed by the disappointment of missing the bird on the ground. The distinguished ornithologist, Coues, referring to Swainson's Hawk wrote: "Though really strong and sufficiently fierce birds I scarcely think they are smart enough to catch birds very often.[2] For my own part, I believe that their failure "to catch birds very often" proceeds more from disinclination than inability to do so. Where locusts, mice and frogs are exceedingly abundant, as is usually the case here, these indolent hawks which would "rather snatch stealthily than capture in open piracy" [3] are reluctant to exert themselves to hunt the more agile game. I have only once myself seen a Swainson's Hawk in pursuit of a flying bird, although such a chase must not infrequently occur when the hawk is famished or ground game is scarce or absent. In this flight, at any rate, the hawk acquitted herself with considerable dash, and, so far as I know, has added a new record to the hitherto published history of the species. During August, 1909, I saw the female of the pair of Swainson's Hawks which had been under observation, and whose young had then flown, make a determined stoop at a Lark Bunting (*Calamospiza melanocorys*) on the ground. The quarry crouched under the lowest wire of a protecting fence, and there was no wind to aid the hawk which was obviously so hungry that her valor over-

[1] British Birds, Vol. 1, p. 120.
[2] Birds of the Northwest, 1874, p. 358.
[3] Coues *op. cit.*

came her discretion. The consequence was that she just missed the bird but collided with the fence, and, losing her balance, fell over. The terrified bunting was the first to recover its wits, and justified its name by soaring straight upwards like a true lark before it flew swiftly away. To my great astonishment the flustered hawk rose in the calm air and flapped after the now distant bunting. With steady beats of her long wings she appeared to be making but slow progress, whereas, in reality, her speed was more than double that of the fugitive, and she soon overtook it. When, as it appeared to me, about a yard above her quarry, the hawk made a sudden dash to seize the bunting in her claws, which the latter cleverly evaded and then flew off in a different direction. Being assailed only by a clumsy buzzard, which could not "throw up" like a falcon, the little bird escaped rejoicing, although by a narrow margin. The entire absence of wind greatly impeded the hawk, and prevented her from sweeping up to her quarry in the first instance, while causing her to flap heavily during all the time of the pursuit, and when endeavoring to recover herself after the attack. It was clear to me that, had there been a breeze, the result would have been widely different, as Swainson's Hawk is a bird of powerful flight — in some specimens the tips of the long folded wings extending beyond the tail. Upon subsequent reflection I was not so much surprised by this valiant flight so contrary to the usual accepted estimate of Buteo. Field naturalists often generalize upon insufficient data, and the many misleading accounts of the Golden Eagle (*Aquila chrysaëtos*) which is only a large buzzard, at once come to mind. It has often been depicted as of a cowardly nature, subsisting exclusively on carrion, or on small mammals and birds which it always seizes on the ground. As regards the charge of cowardice (if I may be pardoned a digression) no one can read the accounts of this eagle in Turkestan and Russia where it is flown at deer, antelope, wolves, and sometimes the bustard, as given by Mr. J. E. Harting in his 'Hints on the Management of Hawks' without being thrilled with admiration at the bird's prowess. Mr. Harting gives the translation of a letter (op. cit. p. 185) he received from the late Mr. Constantine Haller, President of the Russian Falcony Club at St. Petersburg, who referring to the flights of the eagle at wolves remarks: "It sometimes happens that,

if its stoop be true, it will split the skull of a fox at one blow, and its strength is such that it can easily knock over a young wolf, or a sheep. Even a Kirghiz in the saddle (so the natives say) cannot resist it if it comes at him on the wing. This unfortunately happens sometimes if the Eagle misses its prey. To fly at a wolf the largest and strongest bird is selected. It stoops again and again at the beast, eventually seizing it by the head and neck. Occasionally the wolf contrives to shake off the bird with a frantic effort, or by rolling on the ground; but if it has a good start and goes away full speed, the falconer follows on horse-back and helps his bird to kill the quarry." It is also asserted by the Kirghiz that wild eagles "will attack and kill the wolf" (p. 170).

As regards the capture of flying birds by the Golden Eagle: my brother Mr. Allan Gordon Cameron, has frequently descried an eagle on the Island of Jura, Scotland, "hawking grouse just as a peregrine will do," and, on one occasion the royal bird in full chase of a grouse passed within a few feet of his head as already related in 'The Auk.' Moreover Mr. Seton Gordon has conclusively shown that this splendid raptor easily cuts down flying ptarmigan with a blow from its wing. In Montana, a Golden Eagle has been observed to attempt the capture of a wild goose (*Branta canadensis*) from a northward-bound flock.[1]

The Harrier (*Circus cyaneus*) which is not specifically distinct from the Marsh Hawk (*Circus hudsonius*) is considered the most ignoble of hawks and about the least likely to strike down a flying quarry. Nevertheless, I have myself observed the latter to chase birds on the wing, and Dr. A. K. Fisher has seen it do so "in a few instances."[2]

In the review of a Persian treatise on falcony translated by Colonel Phillott, we read: "Our Persian prince, however, succeeded in training one (a harrier) to take a *Chukor*, or Red-legged partridge, and on a second occasion, when in Baghdad, he wagered a valuable mare with some local sportsmen that within the space of fifty days he would reclaim a harrier, and successfully fly it at wild quarry. He flew it in the presence of his friends, and took with it a black partridge (or francolin), a quail, and a rail."[3]

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[1] See Auk, XXV, 1908, pp. 258–259.
[2] Hawks and Owls of the United States, p. 28.
[3] London Field, April 10, 1909.

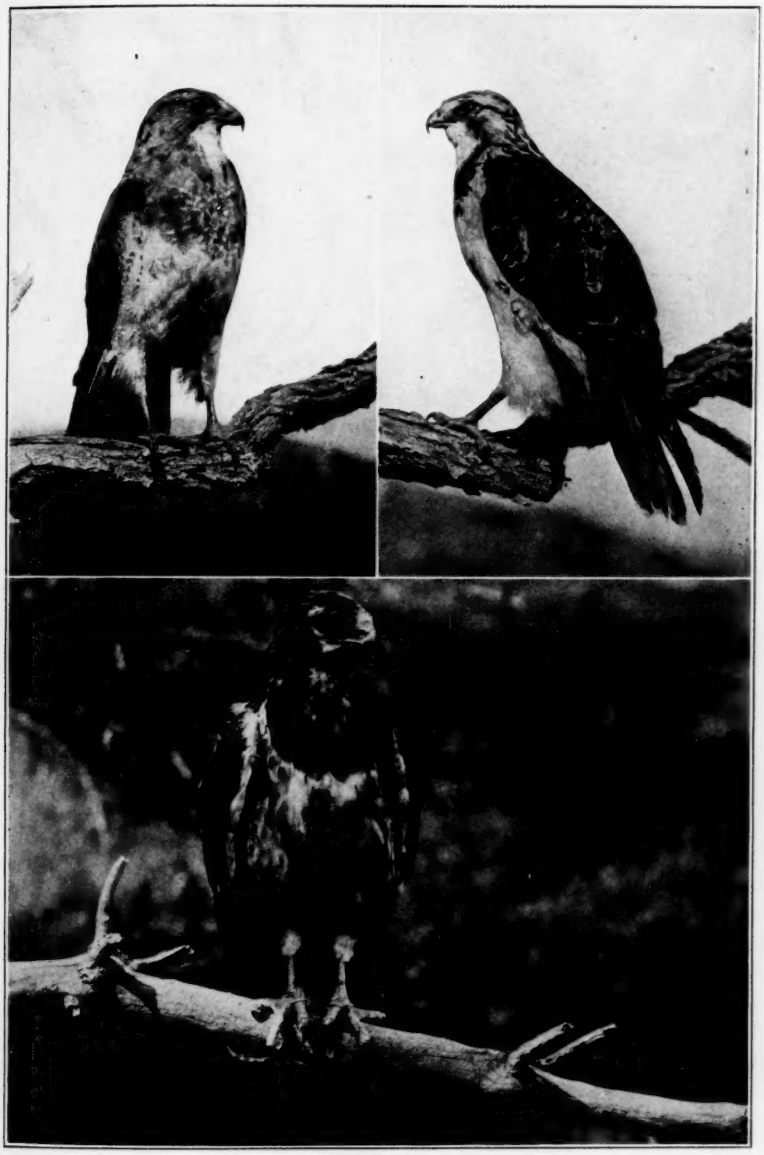
A flight by any kind of wild eagle or hawk is rarely witnessed, even by those persons, who, by reason of a lifelong familiarity with the raptores in their haunts enjoy special opportunities for seeing it. Of the Red-tailed Buzzard (*Buteo borealis*) which in its second plumage bears a strong resemblance to a Swainson's Hawk of the same age, and does not surpass (even if it equals) the latter in flying powers, Dr. A. K. Fisher has written: "On one occasion the writer saw one of these birds stoop at a crow which had just been shot. During the descent the crow made considerable commotion, which evidently attracted the Hawk, for with a swiftness of flight that would have done credit to the Duck Hawk, it struck the crow just as it reached the ground." [1] The above is very different behavior to the usual conception of this bird.

III. PLUMAGE.

The first plumage of Swainson's Hawk has been admirably described by the distinguished ornithologist, Coues and other writers. As regards the subsequent plumage changes, however, it appears to me that much confusion has arisen; nor is this to be wondered at when it is considered that immature birds, both male and female of the same age, exhibit endless differences in coloration. In an authoritative work on birds the following passage occurs: "The Buzzards have usually been placed next the Eagles, with which they have many points in common; but they differ, among other things, in assuming, it is said, the adult plumage after the first moult, whereas it takes several years for the Eagles to attain full plumage." [2]

While the above may possibly apply to some species of buzzards, it is certainly incorrect in the case of *Archibuteo ferrugineus*, *Buteo borealis calurus*, and *Buteo swainsoni*, all of which I have kept in domestication. To the two former I will again refer, and at present deal only with the latter. In my opinion, at least four distinct plumage changes can be traced in normal individuals of this species — in other words, the adult dress is assumed at about four and a

[1] Hawks and Owls of the United States, pp. 48–49.
[2] Birds of The World. Frank H. Knowlton. 1909.



SWAINSON'S HAWK (*Buteo swainsoni*).

1. Adult, Four Years Old. 2. Two Years Old. 3. One Month Old.

(1 and 2 from mounted specimens.)

half years old. To begin at the beginning: the nestlings are hatched covered with fluffy down, but at first show much pink about the head, where the down is absent.

In two weeks black feathers are mixed with the white down, and at three weeks old the birds are nearly full-feathered, their heads and breasts alone showing white. (See Pl. XII.) As at this age they are physically unable to stand up, it is impossible to obtain an artistic picture. At a month old the nestlings are full-fledged, but still occupy their nest, although the females, which are more precocious, can fly well in a wind after a few attempts. The latter may be recognized by their larger size and more spirited demeanor.

First Male Plumage.

The first plumage common to both sexes is retained for a year. Until my tame hawk had finished his moult, in October, his appearance coincided exactly with the 'young of the year' so ably described by Coues as below. (See photo of hawk at eight months old.) "Entire upper parts dark brown, everywhere varied with tawny edgings of the individual feathers. Under parts, including lining of wings, nearly uniform fawn-color (pale dull yellowish-brown), thickly and sharply marked with blackish-brown. These large dark spots, for the most part circular or guttiform, crowd across the forebreast, scatter on the middle belly, enlarge to cross-bars on the flanks, become broad arrow-heads on the lower belly and tibioe, and are wanting on the throat, which is only marked with a sharp, narrow, blackish penciling along the median line. Quills brownish-black, the outer webs with an ashy shade, the inner webs toward the base grayish, paler, and marbled with white, and also showing obscure dark cross-bars; their shafts black on top, and nearly white underneath. Tail-feathers like the quills, but more decidedly shaded with ashy or slate-gray, and tipped with whitish; their numerous dark cross-bars show more plainly then those of the quills, but are not so evident as they are in the old birds." [1] The legs, feet, gape and cere are chrome yellow, the

[1] Key to North American Birds, p. 547, Ed. 1887, and Birds of the Northwest, p. 359.

claws black, and the bill slate color. The irides in the newly fledged young are blue gray which soon changes to pale hazel. Fledglings vary in the shade of yellowish-brown, amount of white, and number of spots on the under parts. The spots apparently darken with age until the moult, as my tame hawk became gradually more and more chestnut.

SECOND MALE PLUMAGE.

The moult was begun on April 9, when the bird was kept in a large specially made cage so that I could collect his feathers and observe the order of losing them. He began by shedding his quills — the inner primaries (seventh in each wing) being the first to fall out. By April 29, I had picked up five primaries and four secondaries when the hawk ceased temporarily to lose any more feathers. On May 8 he commenced to moult the feathers of the wing coverts, but as he pulled all the smallest in pieces it was impossible to keep an accurate count of these. On May 26, the new centre tail feathers were observed to be growing down above the ten old rectrices possessed by the hawk, which, however, had eleven when clean moulted. (Two other examples of the same age had eleven rectrices each). On June 8, the two old centre tail-feathers fell out, and on the 9th and 10th three more rectrices were lost. At this date the bird displayed a mixed bi-colored tail of old and new feathers when, as pointed out by Coues [1] the new tail-feathers and quills were strongly slate-colored in striking contrast to the dark brown old ones. During the three days above mentioned the hawk also lost a primary and several feathers of the wing coverts, which, as usual, he tore in fragments. On July 3 he shed another primary when he was again given his liberty. The moult extended over a period of six months, and the outer or first primaries were the last feathers to be shed, as is the case I believe with all raptores.

This tame hawk moulted into a plumage in many respects similar to that worn during the first year. With the exception of a white occiput, and nearly white "flags," the whole of the

[1] Key to North American Birds, 1887, p. 546.

head, neck and underparts became rich cream color. To be very precise, the shade exactly matched the pale side of a Graham biscuit as sold in cartons by grocers. The spots had all disappeared excepting a few arrow-heads and longitudinal bars on the upper breast, and some others on the sides which were mostly concealed by the wings. The upper parts appeared to be much lighter than before, although the ground color was only a shade less dark than the chocolate brown of the first plumage. This light effect was produced by a border of white and chestnut, or white alone, which replaced the tawny edgings to the feathers of the back and wing coverts. Some of the secondaries were pure white. The crown, sides and back of the neck were streaked with the dorsal brown. The underside of the wing was of three shades. From the wrist downwards for five inches it was the cream color of the breast, then became a silvery gray to the end of the secondaries (seven inches more), which was merged into five inches of blackish brown constituting the primary tips. The wings were thus seventeen inches long, and extended for six eighths of an inch beyond the tail — although in a wild example of the same age they exceeded it by one and one half inch. The tail feathers were all tipped with white, the upper tail coverts being also of this color, variegated with mixed brown and chestnut bars. I am fully convinced that the young bird from the Rocky Mountains (10, 761) described in North American Birds, Vol. III, p. 264, also *Buteo swainsoni*, var. *oxypterus* normal young plumage, p. 266–267 op. cit. of which an illustration is given, are both examples of Swainson's Hawk in the second plumage. In fact, the description of the young female var. *oxypterus* (33508) p. 367, would fit my tame bird after moulting with but slight alteration. As the spots of the underparts may or may not persist in the second plumage, they are not to be relied upon as an indication of age.

I may here remark that my Swainson's Hawk in second plumage bore a striking resemblance to a Western Red-tail of the same age (three of which I reared from two different nests) when both were seen from behind. The only points of difference were in the brown tail and much shorter wings of the Red-tail, which undoubtedly has four parallel plumage changes to *B. swainsoni* before becoming adult.

THIRD MALE PLUMAGE.

My hawk was unfortunately lost in 1910, which prevents me from proving absolutely from a captive specimen that the following conclusions regarding the third dress assumed, are correct. Nevertheless, I believe that I can present a fairly accurate account of the subsequent plumage changes in this species, based upon a study of thirty skins and hundreds of wild birds. It must always be recollected that, as some individuals differ remarkably in plumage from the congeners of the same age, allowance has to be made for these dissimilarities. For example, in both sexes the chief second plumage variation consists, apparently in the retention or extinction of the spots on the underparts which form so conspicuous a feature in all birds of the year. In the third male plumage the whole of the upper parts are light umber brown with the head of a darker shade. Many feathers of the back and scapulars are chestnut-edged, but the white margins of the second plumage have disappeared. The primaries are brownish-black above becoming ashy, or pale slate, towards their bases on the inner webs, and slate color beneath, gradually blackening near the tips. The entire upper breast is bright cinnamon with a purplish bloom, and it is in this plumage that the white throat first appears, in strong contrast to the cinnamon upper breast and sooty brown head. In three examples before me this white patch measures two and a half inches long by one and a half inches wide. The ventral surface and lining of the wings are buffy white, slightly flecked or broadly splashed (according to the specimen) with a paler tint of the breast color. The newly-grown light slate tail-feathers have eight dark bars, and are a still paler shade of slate below, but fade to brown before the next moult on the exposed parts. The two upper rectrices always turn more or less brown except at their bases which are protected by the secondaries in the folded wing. If the former are raised, the original slate-colored tail is disclosed.

FOURTH MALE PLUMAGE.

In the fourth male plumage which resembles the third, and bears the same relation to it as the second does to the first, the bird becomes lighter everywhere. The whole of the underparts are white, and the broad cinnamon band of the upper breast is reduced to a narrower one of white-spotted chestnut, against which the immaculate white throat is less sharply defined than in the third plumage. The head is smoke color, or ashy, the occiput white, and the upper parts always, in my experience, either pale buffy brown, brownish ash, or bluish ash, but never dark brown as described by some ornithologists.

In Fisher's 'Hawks and Owls of the United States,' p. 78, 1893, Knight's 'Birds of Maine' (p. 230, 1908), and Knowlton's 'Birds of The World' (p. 257, 1909), one plumage phase of the normal adult male is, in my opinion, correctly given as "grayish brown," but no reference is made in ornithological works to the other color forms of bluish ash and buffy brown. Dr. Jonathan Dwight, Jr. was good enough to comment on a paper of mine on the plumage of *B. swainsoni* published in 'The Auk' (Vol. XXV, p. 468), remarking in 'Bird Lore' (Vol. X, p. 267): "The gray birds may change to brown through wear just as the loss of the "frosting" of some Terns' feathers produces blacker wings." I have myself come to the conclusion that this is probably what occurs, and that from the effects of wear and light on the feathers the ash colored birds become browner. I am the more inclined to adopt this view because, as above mentioned, in all specimens examined by me the tail has faded to brownish whenever exposed to weather or light, while its covered portions retain their pristine ash or slate-color untarnished. Otherwise the three color forms of buffy brown, bluish ash, and brownish ash can only be explained by dimorphism. As Swainson's Hawk is so widely distributed in its breeding range, which extends from Alaska to Chile, normal adults from different localities might easily differ in the color of the mantle. The discoveries of Dr. J. A. Allen on the relations between locality and coloration in American animals, from North to South, will at once come to mind, as his remarks have been freely quoted by most naturalists. He

found "a decrease of intensity of colour with a decrease of humidity, the paleness evidently resulting from exposure and the blanching effect of intense sunlight, and a dry, often intensely heated atmosphere." The same phenomena were observed in birds, on passing from East to West, "the darker representatives of any species occurring where the annual rainfall is greatest, and palest where it is least." Thus, strong sunlight has a bleaching effect, while a humid atmosphere causes intensity of pigmentation.[1]

With regard to the melanistic form of this hawk, Dr. A. K. Fisher states (op. cit.): "From the above (grayish brown) there are all phases of plumage to a uniform sooty brown"; and, in the buzzard host observed by me in April, 1890, on the Powder River (Auk, Vol. XXIV, p. 262) numbers of melanistic individuals were present. In one day I beheld more of the latter than I have seen in the last twenty-two years of the Western Red-tail (*Buteo borealis calurus*) which is reputed to have a strong tendency to melanism; but I have not met with flocks of the Red-tail like those of Swainson's Hawk.[2] To sum up I consider that normal male members of Swainson's Hawk have two dark and two light plumages before becoming adult. According to my observations the bird does not breed until the fourth year, or until after it has assumed the first light plumage.

FEMALE PLUMAGE.

As previously narrated, the female of my pair of Swainson's Hawks escaped, and could not be captured, even with the aid of a pony. I am thus unable to prove the following conclusions from a captive specimen. In my opinion, the female has at least four distinct plumages parallel with the male (two dark and two lighter) and, like him, does not become fully adult until nearly five years old. The two first plumages are indistinguishable from those of

[1] Compare 'A History of Birds' by W. P. Pycraft, p. 83, 1910.

[2] Melanotic examples of the Red-tailed Hawk may be seen here in the striking plumage of chocolate-colored body and chestnut tail barred with black. In two specimens before me the tail of one of these hawks has eight and of the other twelve bars. I have never myself seen a black Swainson's Hawk with a noticeably light-colored tail.

the male, and the second plumage corresponds to the description of a young female, No. 33,508 in North American Birds, Vol. III, p. 267, as before mentioned. Always darker than the adult male, the two light normal female plumages coincide with his in the pattern changes of the underparts, which, although differing in color, show the same gradual diminution of the brown or chestnut pectoral area and the whitening of the ventral surface. I agree with Coues when he states that in the female "changes of plumage with age affect chiefly the underparts; the back, wings, and tail are more nearly alike at all times."[1]

THIRD FEMALE PLUMAGE.

In this plumage the female Swainson's Hawk assumes the white throat, and, according to my observations, first begins to breed — that is in her fourth year. She has now the appearance of a plain brown and white bird. Her upper parts are precisely similar to the third male plumage (light umber brown) except that the chestnut edging to the feathers of the mantle is absent in the female. There are some bright chestnut lateral feathers concealed by the wings, and a trace of this color on the thighs and abdomen. The white ground of the latter is thickly variegated with wavy cross-bars of the color of the back, and some lateral feathers near the thighs are entirely brown. The large pectoral patch conforms in extent to that of the third male plumage, but in color exactly matches the back. The new primaries and tail feathers are slate colored but fade to dark brown before the next moult while the underside of the former is pale slate, blackening at the tips.

FOURTH FEMALE PLUMAGE.

In this the upper parts are unchanged. The hawk whitens considerably beneath, the pectoral patch is smaller, as in the equal-aged male, and becomes mahogany color in place of brown. The abdomen is thickly marked with triangular spots and cross-

[1] Key to North American Birds, p. 547, Ed. 1887.

bars of the former hue or even chestnut in some examples. The tibioe are pale chestnut. Adult females are met with nearly as light-colored beneath as some third plumage males, and for a long time I was greatly perplexed by them — being reluctant to shoot specimens on account of their exceeding tameness.

The passage in Coues describing the adult female (op. cit., p. 547): "throat pure white but other underparts probably never whitening decidedly" led me to suppose that these might be males despite the fact that they were incubating. Having at length watched the mother of my tame hawks (which was of this light type) lay an egg, all my doubts were removed.

A SUCCESSFUL PAIR OF ROBINS.[1]

BY WINSOR M. TYLER, M. D.

THE following notes, taken for the most part while I had the birds under my eye, tell the story, as I saw it, of a pair of Robins (*Planesticus migratorius migratorius*) who successfully reared two broods of young from the same nest between April 26, 1912, when the nest was begun, and July 8, 1912, when the second brood was fledged.

I am sorry that I was able to watch the birds very little during the rearing of their first brood. After the completion of the nest, my notes give merely the dates of incubation, hatching and fledging. They make no reference to the feeding of the young and none to the disposal of excrement. I regret especially the latter omission, for, if we knew how generally the excrement was eaten early in the season, we might, by comparing the later behavior in this respect, get a hint of the extent that the excrement is used to satisfy hunger. In early July, when the female parent was feeding her second brood, her feathers showed much wear and she appeared emaciated. At this time, she almost invariably ate all the excrement that the

[1] Read before the Nuttall Ornithological Club, Feb. 17, 1913.

young birds voided, during the time I had her under observation. My regret is that my notes do not show whether this habit was equally constant in May, when her general condition was good.

May 1st. At 5: 30 A. M. yesterday and again at the same hour this morning, a rather bright colored Robin, but a female I have no doubt, worked for half an hour or more on a nest in the crotch of a locust tree opposite my side window, in Lexington, Mass. The nest is fifteen feet from the ground. Its base was originally white and was made of white strings. This morning she added straw and more strings. When she comes in with her bill loaded with the material, she adds it to the center of the nest, stands upon it and scratches with her feet. Then she settles and pressing down with her breast, turns around this way and that. The effect is to drive downward the newly added material into the fast forming cup of the nest and to loosen some of the strings on the edge. These loose ends she seizes in her bill and imbeds firmly in the sides of the nest, thereby building up the rim of the cup.

May 6th. The nest is nearly completed. Today a steady drizzling rain is falling from the southeast. The robin worked during luncheon time. Her method seems the same; — each time she arrives at the nest, she seats herself in it, scratches, and then presses the material downward. I believe that no mud was used in the construction of the nest.

Incubation began about May 12th.

The young birds hatched about May 26th.

June 7th. The young robins all leave the nest in the early morning. In the afternoon, there is pandemonium in the yard next door. A little girl is unwittingly playing near one of the young birds and the parents are distracted. As alarm notes, they use the sharp, high "Pleent" and the lower toned, nasal "hŭnt" They are not at rest for a second; they fly down over the child's head, nervously restive; they pump their tails, flit their wings, fly back and forth, always crying. A Chebec, a Purple Finch and a Warbling Vireo sing on, undisturbed.

June 8th. In spite of the excitement of yesterday, the female bird repairs the nest.

June 13th. Incubation begins.

June 23rd. The female bird, although she sits on the nest most

of the time, appears restless. She often picks something from the bottom of the nest or from its edge and eats it. It may be that the young are hatched, but I see no feeding.

June 25th. The young are hatched now. This morning their mouths appeared above the rim. Both parents feed; twice seen together at the nest. The female covers young after feeding and often prods about in the bottom of the nest in what appears to be a careless and dangerous way.

June 28th. Both parents again feed their young, meeting as before at the nest.

June 29th. Four young are fed often by female parent who each time, picks from the nest and swallows whole, big white sacs of excrement. Generally she finds two pieces. The fool consists of earthworms and something green which may be the green worm, the favorite of the Vermivoræ. The female covers young for the night at 7: 30,— a dark cloudy evening. I suspect that sometimes the male bird collects food and passes it to his mate who carries it to the nest for the young.

July 1st. The young birds this morning fill the nest level full. They are restless; they toss themselves about in the nest and make attempts, apparently, to preen their feathers. The female covers the young, as best she can, at 7: 35 P. M.

July 2nd, 7: 10 P. M. The female parent finds a worm on the lawn, and shakes it many times before flying directly to the nest and feeding the young. Now when the parent comes to the nest there is just the faintest sound from the young birds; a little ticking sound, audible only when I am very near.

The female feeds young, then stands still looking down into the nest with head slightly on one side. One nestling rises and passes a fæcal sac directly into the bill of the parent, who stoops to receive it. At the next visit, this is repeated, but as two young void at the same time, the parent receives only one sac directly; the other she snaps up from the nest.

From the deliberate way in which a young bird tilts and then discharges the sac, it seems evident that he understands what his parent expects of him, when she stands at "attention" after feeding. From my room, thirty feet away, I can tell at once when the parent arrives at the nest by the "ticking" of the young birds.

July 4th. The young are feathering out fast. They rear up and flap their wings, in danger sometimes, it seems, of falling. Between the parent's visits, the young sink down into the nest. Their heads and necks, hanging limply over the edge, look like dead snakes. 7:20 P. M. The female arrives with beak empty. The young rear straight up, swaying drunkenly — she stands motionless — they sink down, then one, and later a second, young bird raises his rear and passes a fæcal sac directly into the parent's beak. She, as always before, swallows both sacs. The young settle down at once. It is growing dark. The act of raising his hinder extremity to void fæces is apparently as conscious an action as rearing for food and it is likely that both are associated with the presence of the parent bird. 7:44. The female returns. The young rear, but, as she stands motionless, they subside. She snatches up a bit of excrement (I judge from her actions; it is too dark to see) and then settles on the rim of the nest, partly covering her young, probably for the night.

July 5th. Both parents feed the young in the morning. 7:15 P. M. The female parent visits the nest, perhaps feeds — the young strain up toward her making a sound like "si-si-si-si" etc. The old bird stares at them — one turns up, and quivers his quarter-inch tail — the parent snatches the sac. 7:30. The parent returns; she feeds her young little, if any; she eats three fæcal packages. The young birds now flap their wings when they rear.

July 7th, 8:30 A. M. The young birds act very differently this morning. They are so large that when they move about they overflow the nest. One of the brood often stands on a branch of the crotch and moves back and forth between it and the nest, using his wings (flapping) as well as his legs. The parents stand off and "cluck" or "tut" to the young who answer with a very similar note — like the "quack" of a Catbird. When the venturesome young bird stands on the branch and the sac falls toward the ground, the parent dives for it. Both parents come about the nest, but stand off and call before feeding. When they bring food to the nest, the young give their former "sizzling" note. I notice for the first time the female parent leave the nest with a sac in her beak. 11:45. The young stand straight up on the nest edge when the parent comes near. In the interval between her visits, one squats

on the branch wholly out of the nest. The rest slump back into the cup and continually preen their feathers, scratch themselves, stretch their wings or restlessly plunge about. They now utter a loud exclamatory "kwut." The parent arrives. All four young stand up facing her, flapping their wings and "sizzling." She goes away and returns at once from the cherry tree with a whole fruit. She crams this down first one throat and then another, sometimes letting go of it for a second, sometimes retaining her hold. She pulls it out again and again. Finally a young bird swallows the cherry.

July 8th. Three of the young birds left the nest in the early morning. Great excitement in the family! The fourth remained in the nest all day. He was fed regularly, I think, and the nest was cleaned as usual. He may have flown in the evening, but the next morning the nest was empty.

The history of this pair of Robins illustrates the division of labor practised by this species in rearing their young (the male assuming the full charge of the first brood when they left the nest), and the nice economy of time by which without the loss of a single day, preparations for the second brood followed the fledging of the first (four fertilized eggs being laid within six days after the young had flown).

When I read these notes at a meeting of the Nuttall Club, Mr. Brewster said that while it was well known that adult Robins ate the excrement of their young, he believed that the behavior of this female bird was exceptional in that she fed upon the fæces to an unusual extent.

I should like to add a word on this subject; my notes might otherwise give the false impression that this Robin ate the fæcal sacs solely in the evening. It was mere chance that I wrote my notes chiefly at this time of day: at other hours, her behavior was the same.

THE STATUS OF LLOYD'S BUSH-TIT AS A BIRD OF ARIZONA.

BY H. S. SWARTH.

THE Santa Rita Bush-tit (*Psaltriparus santaritæ*) was described by Ridgway (Proc. U. S. Nat. Mus., X, 1888, p. 697) and remained for some years in good standing in the American Ornithologists' Union Check-List, as a species occurring in, and limited to, the Santa Rita Mountains, Arizona. The principal characteristic of the supposed species, as distinguished from *P. plumbeus*, was the presence of a dusky line on the sides of the head, over the auriculars.

During several seasons collecting in southern Arizona the writer collected a fairly extensive series of bush-tits, keeping a careful lookout for *P. santaritæ*, which, however, for some time he failed to find. Finally, in the summer of 1903, specimens were taken in the Santa Rita Mountains which answered the description, but they proved to be birds in juvenal plumage. In one or two instances adults, obviously in attendance upon these young birds, were collected, and these proved to be *plumbeus;* in other cases flocks from which examples of "*santaritæ*" were secured, were carefully scrutinized without revealing the presence of any individuals with black head markings. Altogether the writer felt convinced that the supposed Santa Rita Bush-tit was in reality the immature plumage of *P. plumbeus*, and so stated in a paper on the birds of the Santa Rita Mountains (Condor, 7, 1905, p. 81).

In the meantime Mr. Oberholser had published a synopsis of the genus *Psaltriparus* (Auk, XX, 1903, pp. 198–201), in which he made the following statement (p. 200) in regard to the disputed species. "The type of Mr. Ridgway's *Psaltriparus santaritæ* is an immature male of *lloydi*, as a careful examination shows, and it can be easily matched by young male specimens from any part of the range of the latter."

In accordance with this idea the third (1912) edition of the A. O. U. Check-List (p. 353) gives the range of *Psaltriparus melanotis lloydi* as including southeastern Arizona, presumably upon Oberholser's statement quoted above.

So the matter rested until recently. In the course of the preparation of a distributional list of the birds of Arizona it became desirable that the status in Arizona of these two species of bush-tits, *plumbeus* and *lloydi*, be definitely settled, and all material available was carefully scrutinized. In the course of this study additional specimens were discovered which appeared to prove conclusively the correctness of my previous assertion, that *santaritæ* was a synonym of *plumbeus* and not of *lloydi*.

The expedition which the University of California Museum of Vertebrate Zoölogy sent to the Pine Forest Mountains of northern Nevada in 1909, secured a large series of *Psaltriparus plumbeus*. Included therein are a number of birds in juvenal plumage, and a proportion of these have the head marking of "*P. santaritæ*." As there was no question of *P. m. lloydi* occurring in this region, this was a conclusive demonstration that the young of *plumbeus* frequently have more or less black on the head. The evident conclusion to be drawn from this was that "*Psaltriparus santaritæ*," occurring in a region where *plumbeus* is abundant, should be regarded as the young of that species and not of *lloydi*, unless adults of the latter species also were taken in the same place. As far as I knew there were no Arizona records of *lloydi* other than of the birds first described as "*santaritæ*," but the possibility that adult specimens of *lloydi* had been taken within the state, and that their capture was authority for the extension of range as given in the Check-List caused me to make inquiry in this particular.

Correspondence with Professor W. W. Cooke, of the Biological Survey, elicited the fact that no such adults had been taken, and that the inclusion of southeastern Arizona in the range of *lloydi* was based entirely on the belief that "*santaritæ*" was the young of that species. After examining the young birds which I sent him, Professor Cooke agreed with my conclusion that there was nothing to justify the further retention of *Psaltriparus m. lloydi* in the list of Arizona birds. He remarked further that there seemed to be no way of distinguishing with certainty between the young of *lloydi* and those examples of young *plumbeus* which possess the black head markings.

Following are brief descriptions of individuals of the Lead-colored Bush-tit (*Psaltriparus plumbeus*) in juvenal plumage. As

young and adult are practically alike in general body color these descriptions are restricted to the head with its distinctive markings.

No. 8616 (Mus. Vert. Zool.); juvenal, sex undetermined; Pine Forest Mountains, Nevada; June 14, 1909. Head with an extensive "mask" of black. Lores and space about eye (5 mm. below, 2 mm. above, 5 mm. behind) black, sharply defined against gray of rest of head.

No. 8614 (Mus. Vert. Zool.); juvenal male; Pine Forest Mountains, Nevada; June 14, 1909. Faintly defined black collar at back of neck, produced by black tips to the feathers.

No. 8625 (Mus. Vert. Zool.); juvenal male; Pine Forest Mountains, Nevada; June 27, 1909. A black line through the eye, widening posteriorly so as to form a triangle on side of head; continued over back of neck as a narrow black line.

No. 8611 (Mus. Vert. Zool.); juvenal, sex undetermined; Pine Forest Mountains, Nevada; June 2, 1909. A narrow line of dull black beginning behind auriculars and extending over back of neck.

No. 8618 (Mus. Vert. Zool.); juvenal male; Pine Forest Mountains, Nevada; June 11, 1909. Similar to No. 8611, but not so distinctly marked.

No. 4099 (Coll. H. S. S.); juvenal male; Santa Rita Mountains, Arizona; June 25, 1903. Black line extending backward from eye over side of neck.

No. 4098 (Coll. H. S. S.); juvenal male; Santa Rita Mountains, Arizona; June 25, 1903. A triangular shaped black mark extending backward from eye on side of head.

ANATOMICAL NOTES ON TODUS, OXYRUNCUS AND SPINDALIS.

BY HUBERT LYMAN CLARK.

DURING a recent visit to Cuba, Dr. Thomas Barbour was so kind as to secure alcoholic specimens of Todus and Spindalis for my study and I am glad to express here my thanks for his thoughtfulness. Mr. Ridgway has very kindly entrusted to me the remains of a specimen of Oxyruncus which he collected in Costa Rica and I have to thank him and Dr. Richmond for giving me the opportunity of examining this interesting bird.

TODUS.

The anatomical characteristics of this genus have been so fully worked out by Murie (1872, Proc. Zool. Soc. London, p. 664) and Forbes (1882, Proc. Zool. Soc. London, p. 442) that there would seem to be very little to add to their accounts. But the former confined his studies to the skeleton while the latter deals with the pterylosis so briefly that a few more details may well be mentioned. Forbes has called attention to the very short intestine in Todus; in the specimen before me from Cuba, it is about 70 mm. long or just about equal to the length of the bird without its tail feathers. The arrangement of the loops of the intestine is strikingly like that of Alauda as figured by Gadow (1879, Jena. Zeits., vol. 13, pl. XI, figs. 8 and 11) except that the loop 4–7 is not nearly as long. In this respect it resembles the arrangement in Cypselus (l. c., Pl. X, fig. 10), to which it is very similar.

Nitzsch's account (1840, Syst. der Pteryl. p. 127, pl. IV, figs. 9 and 10) of the pterylosis of Todus is unfortunately not very accurate. Forbes suggests that this was probably due to his observations being based on the study of skins. While this is no doubt true, it is also due in part to his inclusion of *Todirostrum cinereum* (L.) with *Todus viridis* L. in the genus Todus. It is hardly strange that the study of the skins of two birds belonging to

different orders, under the impression that they were congeneric, should lead to mistakes in describing the pterylosis of the genus! Forbes has pointed out that the sternal tracts are not remarkable, as they are figured by Nitzsch, but are quite like those of many Passerine birds, broad, undivided but abruptly contracted where they pass into the very narrow ventrals. The connection between the sternals and the humerals over the base of the wing is however unusually well feathered and this, no doubt, has led to one of the errors in Nitzsch's figure 9. Nitzsch says there are 19 remiges which Forbes corrects to 20, but the specimen at hand shows 21 very clearly, there being 11 secondaries in each wing. In the pterylosis of the head, there are certain peculiarities which neither Nitzsch nor Forbes mention but which are of some importance nevertheless. The back of the head is very sparsely feathered but about the middle of the neck the upper cervical tract begins abruptly and is densely feathered. The frontal tract is thickly feathered and is sharply limited on each side by a conspicuous supraocular apterium. The lower cervical tract continues clear to the gonys as a narrow, thickly-feathered strip bounded on each side by a prominent apterium along each ramus of the lower jaw. In all these three features, there is a noticeable resemblance to the pterylosis of Alcedo.

In the specimen before me, which is an adult *Todus multicolor* Gould, from Cojimar, Havana Province, Cuba, there is an interesting peculiarity, which calls for special comment. There are only eight rectrices and, while examination shows that one of the middle pair and one of the outside pair have been accidentally lost, it is clear that this bird never had but *ten*. Nitzsch gives the number of rectrices in Todus as twelve and all later writers have followed him. Through the kindness of Mr. Bangs, I have examined a number of skins of Todus from Cuba, Jamaica, Hayti and Porto Rico and in every case there are twelve rectrices. It seems then that this specimen which Dr. Barbour collected in Cuba is an individual variant, which in view of the peculiarities of the little family to which it belongs, is of more than ordinary interest.

OXYRUNCUS.

The only material of this rare bird available for study is the skinned carcase, minus head, limbs and intestines, of a specimen shot by Mr. Ridgway, April 7, 1905, at Bouilla, Costa Rica. The carcase has at some time been partially dried so that the muscles permitted of no careful dissection, and my observations are therefore confined to the tongue (which remains attached to the windpipe), the syrinx, the heart, the sternum, the backbone and the sacrum. In none of these parts, did I find a characteristic feature, but instead a striking resemblance to Sayornis and Tyrannus is evident in all. The tongue and syrinx are so much like those of Sayornis that the only difference noted is that the tongue is a little more horny than in the Phœbe and its posterior lobes have distinctly fewer and much smaller, sharp marginal papillæ. The heart is noticeably large, much larger than that of a Kingbird. It measures about 16 mm. in length by 9 mm. in thickness, while the Kingbird's is about 14 by $7\frac{1}{2}$ mm. The sternum is almost exactly like that of Sayornis, only it is larger and the manubrium is longer, more deeply forked and hence more conspicuous. The scapulæ are a little longer, more pointed and more curved than in Sayornis, but the differences are very trifling. The coracoids are stout and the procoracoids are very conspicuous as in Tyrannus. The vertebral column is like that of Tyrannus in the number of its component parts but the first of the seven pairs of ribs are long and slender as in Sayornis. The sacrum is noticeably larger and its vertebral components more fully ossified than in Tyrannus, so that the sacra of the two genera can be easily distinguished, but none of the differences are important. Indeed, it must be said that so far as the internal structures which I have examined are concerned, there is no reason why Oxyruncus should be separated from the Tyrannidæ.

Mr. Bangs has kindly permitted me to examine the skins of an adult male *Oxyruncus cristatus* (Swains.) from Brazil and of three females of *O. c. frater* (Scl. & Sal.) from Costa Rica. The male shows the peculiar modification of the outer web of the first (tenth) primary perfectly developed, while it is entirely lacking in the three

females. Mr. Ridgway (1907, Bull. U. S. Nat. Mus., No. 50, p. 332) considers the character as really not worth consideration, the serration being so faint as to be practically non-existent." Again on p. 333 (footnote) he says the character is "very indistinct in all specimens examined" and yet on p. 334 (footnote) he says that it is "very obvious in a specimen sexed by the collector as a female." It seems to me that Mr. Ridgway has been misled by the mistake of this collector who apparently sexed a male as female. Such mistakes are not rare, most collectors having probably made them at some time, and it is easier for me to believe that such a mistake has occurred in this case, than to question the importance of this striking character. It is well known that in several genera of Pipridæ, the male possesses peculiar modifications of the wing feathers as a secondary sexual character and it is probable that in Oxyruncus the serration of the tenth primary on its outer web is of a similar nature. More material would seem to be necessary before the question can be definitely settled.

SPINDALIS.

Dr. Barbour collected at Guantanamo, Cuba, a fine pair, male and female, of *Spindalis pretrei* (Lesson) which I have examined with much interest. The general pterylosis is notable only in that the dorsal tract does not have the rhomboidal form usual among Passeres but is narrowly elliptical as Nitzsch figures it in Oriolus. The other tracts show no special peculiarities. The wing is somewhat rounded, the sixth, seventh and eighth primaries being rather short and subequal, with the ninth and fifth still shorter. There are of course nine primaries and nine secondaries. The twelve rectrices are approximately equal, though the outer ones are really the longest. The bony palate is notable chiefly for the very long and slender palatine processes. There is no trace of a secondary palatine process such as occurs in Zamelodia. The alimentary canal is characterized by a rather short and unusually large intestine. The stomach is small, less than 10 mm. long, and there is no crop, though the basal part of the œsophagus is somewhat enlarged. The intestine is only about 90 mm. long, but is about

3 mm. in diameter and there is little difference in size between the small intestine and the rectum. The intestinal loops are naturally few and simply arranged as in many Passerine birds; there is nothing distinctive in their arrangement.

Examination of the sternum revealed the interesting fact that it is like that of any finch, the only peculiarity being in the manubrium which is very large with the two arms or divisions long and widely spreading. There is no trace of an "osseous bridge" from the anterior margin of the sternum to the manubrium such as occurs in Piranga, nor is there any bony roof, either with or without foramina, covering a space back of the anterior margin, such as occurs in Saltator, Pipilo et al. There are no differences to be seen between the sternum of the male in Spindalis and that of the female. The absence of the "osseous bridge" in this genus indicates either that its presence is not characteristic of all tanagers or else that Spindalis is not a tanager.

THE NEST LIFE OF THE SPARROW HAWK.

BY ALTHEA R. SHERMAN.

THE nesting of a species new to our place always is an event of great interest, and doubly so when the birds are of the hole-nesting sort, whose home life at very close range has never been exhibited (so far as is known) to mortal eye; but when the species is one of the Raptores interest heightens and feelings become indescribably mixed; there is the anxiety to watch the nest life mingled with fear for our harmless, little feathered friends, that trustingly have returned to their summer home; hence on April 4, 1912, it was with a perturbed mind that a pair of Sparrow Hawks (*Falco sparverius sparverius*) that had arrived the day before, were watched while they inspected the nest box occupied by Screech Owls two years previously.

Never before in our immediate neighborhood—National, Iowa—

had Sparrow Hawks nested, yet for years man and nature had been at work preparing the way for them. Four years prior to this lightning had smitten the tallest and fairest willow of a group of these trees, and its dead branches invited the Hawks to rest; there the home-seeking pair found facing them, eighty feet away, a hole in my bird blind that gave entrance to a nesting box whose bottom surface, eight by twelve inches in dimensions, was deeply covered with sawdust and excelsior. This place seemed to satisfy them for several days until they ventured to the barn, where they found eight other boxes similarly furnished for nesting and roosting places for Flickers. During the next two weeks they visited the various boxes and scratched in the excelsior, their choice of a nesting place seemingly pointing toward the barn, but in this they were not encouraged. Toward the end of April they again frequented the dead willow and the box in the blind became their final choice.

There the first egg was deposited on April 28 before eleven o'clock in the morning, and an egg was laid on each alternate day until the sixth, and last, on May 8. That the hour for laying was later than that of many common species appears from the fact that on April 30 the second egg had not been laid at half past nine in the morning, but was in the nest by four o'clock in the afternoon, when the nest was again visited and the female found at home. Each egg was weighed upon the day it was laid, and their weights in the order of laying were 212, 227, 220, 225, 228 and 204 grains respectively. Four of these salmon-colored eggs were very similar in appearance, bearing large blotches of a chocolate brown, the sixth egg was finely speckled instead of blotched, while the fifth was strikingly different from the others having large unmarked spaces of the ground color through the center, and some blotches on the ends. The bird that came from it was as marked in its disposition as the egg-shell was in its coloring.

Incubation was performed mainly by the female, only once was the male found in the nest, which he did not leave until the blind had been noisily entered, since by the female sitting on her favorite perch we had been led to think that the nest was unoccupied. On the other hand the female was accustomed to fly from the nest the instant the key touched the lock of the door, if she had not already flown upon hearing human footsteps or voices. Sometimes it was

noted that the eggs were left uncovered nearly or quite an hour, while both birds sat in their tree preening themselves, an exercise in which they spent a vast amount of time.

The first egg proved infertile, the third one, taken to reduce the number of hawks, also as a souvenir, contained a living embryo. Of the remaining eggs the second and fourth hatched on June 4, the bird from the former egg was still wet at 7.45 o'clock in the morning, and weighed 154 grains. The following morning at a quarter of eleven o'clock the hawklet from the fifth egg was found not thoroughly dry, weighing 166 grains, and showing that it had been fed. The bird from the sixth egg still wet, and weighing 139 grains, was found at half past eight o'clock on the morning of June 6. These data plainly show that the period of incubation must have been thirty days for the fifth egg, and twenty-nine days for the sixth egg.

Very soon after hatching the young would bite vigorously at a finger that touched their bills, opening their eyes for an instant as they did so, but not until they were two or three days old did they keep their eyes open longer than a few seconds at a time. From their first day they uttered a faint cry, when expecting food, that suggested the scream of the mature Sparrow Hawk, also peeps similar to a chicken but more mournful. This peeping was continuous while they were out of the nest. There was a third cry, difficult to describe, which they uttered when fed.

On June 13 the first manifestations of fear were detected, when the hawklets flattened themselves on the bottom of the nest, but such signs were rare for a few days thereafter. It was on the following day that for the first time they were seen ranged against the sides of the nest their backs to the wall; this arrangement appeared to be the normal one, thus the center of the nest was given to the one that was eating, or to the mother, when she came to feed them. When two weeks old they could run quite well; when placed on the floor of the blind they ran to the inner angles formed by the studdings and the walls, where with backs well braced they faced the foe, and a few days later met with savage claws an approaching hand.

At a very early age their alert bearing together with their bright eyes and snow-white plumage made a picture long to be remembered.

By June 10, the down, or more correctly the neossoptiles, began to look dirty and the next day pinfeathers showed in this covering. By the 13th, the pinfeathers had pushed these neossoptiles away from the body to such an extent that the nestling looked half clothed. At sixteen days of age the barbs of their remiges showed sufficiently for one to be positive concerning the sex of the hawklets, and it was learned that eggs Nos. 2 and 6 had contained males, and Nos. 4 and 5 females. It was the shell of the fifth egg that bore unusual markings. Could oologists (or the clutchers of eggs) have studied the life of the bird that came from this egg, it is believed that all would have been convinced that "what is in the egg" is of greater importance than the lifeless shell. Numerous visitors came to see the young Sparrow Hawks and a nestful of Flickers that were being reared in the barn. Two of these friends from a distance named the young hawks, bestowing on the older male the name of Jeremiah, and his younger brother, because of his extreme meekness, was called Moses; the females were named Ruth and Jezebel. The last mentioned was an extremely wicked little wretch. When but sixteen days old she began to fight. Upon the opening of the nest door that day the rest of the brood stood back against the side of the nest and opened their mouths, a feeding response probably, but with a threatening mien Jezebel stretched herself to her utmost height, some seven or eight inches, then struck at my hand repeatedly with her claws. From that day onward a marked difference was observed in behavior of the males and of the females. When a finger or a stick was pointed into the nest all opened their mouths; the males did little more than this as they hugged the farthest side of the nest, but the females, springing to the center of the nest, every feather on their heads standing out seemingly at right angles, wings spread, mouths open and squawking, were ready to claw and bite, Jezebel being the fiercer of the pair. When taken from the nest the rapidity with which she would whirl round, when a finger was circled above her, was remarkable especially at the early age of eighteen days. Sometimes clawing was done by Jerry, but Moses usually was as gentle as a dove. The record of their daily weights shows, that after the mother ceased to feed them, the females appropriated more than their share of food, in fact on June 22 it was noted that Moses,

one day younger than Jezebel, was five days behind her in weight, and three days in development of plumage. No strife over their food was ever witnessed. This yielding of their lawful share of food by the males may have had its origin in their disposition in mature life to give the food they bring to their mates. Ruth was found eating more frequently than the others.

Viewing of the nest when the mother bird was at home was eagerly sought. The blind in which the nest was located is a rude structure, forty-five inches square, built for shelter while watching Rails and migrating birds. In preparation for observing the nest while Mother Sparrow Hawk was at home the windows were completely darkened. Some cracks in the walls let in a little light, also a little fresh air, which in the latter days of the nest proved an appreciated blessing. Protection from the faint rays of light that penetrated through the cracks was afforded by the depths of a sun-bonnet. The keenness of vision of a hawk is proverbial, that these precautions were sufficient was proved when for a half hour undetected, I, sixteen inches away, looked through a peep-hole into the mother hawk's eye, and watched her as she brooded. This was not achieved upon the first attempt, when two hours were spent in fruiltess waiting for her coming. After that, except near the close of the nest period when both parents were absent hunting, all attempts to watch the nest during the mother's visits were made after visitors to the blind had left me there alone. At first standing noiselessly upon a box with head scraping the roof of the blind for one hour, or for two hours, was not an easy task, later it became almost insupportable with the heat of an afternoon sun beating upon the blind, and with the stench from a nest, whose walls were thickly incrusted with excrements. But consummation was near at hand when hawk screams were heard from without, that called forth anticipatory peeps from the young after they were old enough to note the screams. When the mother came in there was little clamor and no struggling for food on the part of the nestlings. In their earlier days they merely braced themselves in the circle where they lay, later they stood in an orderly row against the side of the nest. With great rapidity the mother tore the flesh and bending her head almost at right angle with the bill of the young one she gave it the morsel. Her motions in this act were

very dainty and graceful; this bending of her head was apparently necessitated by the hooked beaks of both. Sometimes the pieces served were so large that they were swallowed with difficulty. No more than five minutes were occupied in these feedings. At first the food served was "dressed meat," and the remainders of the feast were carried out by the mother, and eaten by her in the dead willow. On June 17, she brought in the body of a half-grown ground squirrel with the skin still on, probably I frightened her out prematurely, since she left the remnant of the squirrel. It was not until a week later that she began regularly to leave the quarry for the hawklets to feed themselves. Thereafter she entered the nest with the food, but remained inside less than a minute, sometimes no more than twenty seconds.

Experiments were made with the nestlings to see if they would eat living animals. When quite young a blow-fly was given, and some days later newly hatched English Sparrows were put into their mouths, but all were rejected. On June 30, thirty-three English Sparrow nestlings and eggs were given them, among them were two live fledglings nearly ready to leave the nest. The eggs and the dead Sparrows were eaten, but the live Sparrows remained all day in the hawk nest uninjured. It appeared to be a case not of the "lion and the lamb" but of the Sparrow and the Sparrow Hawk lying down together. This escape from the eye of the mother bird must have been due to her very brief visits.

In the spring while the question: 'Shall or shall not the Sparrow Hawks be allowed to remain and increase their kind?' was pending, all available ornithological literature was searched to learn if possible the degree of danger from these Falcons, that was threatening our birds. Besides one writer's statement that to a family of Sparrow Hawks twelve small birds were brought in one day, there was the reliable data furnished by the examination of stomachs of this species. The figures given by Dr. Fisher show that eighteen per cent of the stomachs contained the remains of birds. This is the same percentage that was found for Screech Owls. In previous years we had harbored these predaceous little villains, and some small birds had survived, therefore it was decided to give the Sparrow Hawks a trial at the same time to watch closely their relations with other birds. The first birds disturbed by them

were the Phœbes; when the Hawks frequented the barn the Phœbes disappeared, but when the Hawks were frightened away Phœbe resumed her task of refitting the very old nest that had cradled so many generations of her species; and later two broods were raised there in safety. The Flickers were driven away from the barn, but returned there to nest after the Sparrow Hawks chose the blind for their nest site. The Flickers more expeditious than the Hawks in incubation hatched out their brood on June 6 — the first egg having been laid on May 21 —, this hatching chanced to be on the birthday of Moses, and a comparison of development of Flickers and Sparrow Hawks made an interesting study. The Flickers gained in weight a trifle faster, but were homely, whining, helpless little creatures after the Hawks were well feathered and active. Both species left their nest on the same dates.

After the female Hawk began incubation English Sparrows built a nest in another box in the blind not four feet distant, and there raised their brood. Next to these the species that nested nearest was the Red-headed Woodpecker. A pair of these birds began their nest on May 29, in the dead willow about half way to the top. They brought out but one offspring. It is impossible to say that any of their young were taken by the Hawks. The only time a disturbance was witnessed was on June 28, directly after the Red-heads had changed places in the nest. The female Sparrow Hawk left her perch a few feet away, went to the Red-head's hole and looked in; the departing Redhead returned and drove her away. Exactly forty-six feet from the trunk of the dead willow, and fifty feet or thereabout from a favorite perch of the female Hawk a pair of Mourning Doves raised a brood. Their young were flying about in the willows on June 20. Probably it was this pair that built its second nest in a cedar tree a few rods distant, and its third nest on the site of the second, where a Dove was sitting until September 8, after which she deserted her eggs, containing well developed embryos. This is considered worthy of mention because all the other Mourning Doves of the neighborhood had left before that date. Another pair of Mourning Doves raised two broods in the house yard. From a plum tree nest conspicuously in sight of the Sparrow Hawks a pair of Brown Thrashers brought out four young, which fully grown were following their parents, and begging

for food when the latter were building their second nest. Another pair of Brown Thrashers built their nests in gooseberry bushes, their first nest being 105 feet from the hawk tree, the second 200 feet from it. In both cases the young left their nest, but it is impossible to say that all escaped afterward.

Enough cases have been cited to show that these Sparrow Hawks were not nest robbers like the Blue Jays, neither did they take any of the chickens, numbering fully one hundred and fifty, that were brought out in a yard twenty rods from their tree. As far as my observations extended their avian victims were fledglings not long out of the nest; also that the Hawks were crafty enough not to prey to any great extent upon the birds in the immediate vicinity of their nest among which they were in bad repute. They were frequently mobbed by Bronzed Grackles, that made vicious passes at them, especially if one were eating, whereupon it raised its wings and screamed, perhaps screamed for mercy. A dash of the Kingbirds sent the Hawks squawking from their tree. Once a pair of Baltimore Orioles followed one of them to the tree and for some time acted as if they had a score to settle. At another time Meadowlarks raised a tumult and followed the Hawks. It was feared that the victim that time was the little Meadowlark, that with a Cowbird nest-mate had been watched and weighed from the day of their hatching, and had but recently left the nest. The Cowbird, seen at intervals later, was known to have escaped.

When the hawklets required the largest supply of food the greater part of four days, beginning June 26, was given to uninterrupted study of the home life of the Hawks. Various places were chosen from which to watch, until an upper window in the house was found the best. It was three hundred feet from the nest, but nearly twice that distance was traveled to reach the blind every time food was delivered in the nest. These trips were for verifying the identifications of the quarry, and in case it was a bird to secure its tarsi. The top of the willow was about level with my window from which with the aid of 8-power binoculars the behavior of the Hawks was easily seen. The male did the greater part of the hunting, but there were a few times when the female brought food of her own catching. The average length of the intervals between the bringing of the quarry was two hours and twenty-five minutes, the

longest interval being three hours and forty-three minutes, and the shortest twenty-three minutes. This refers to food that was brought into the tree, not to the nest, for the female frequently ate the game brought in. For example on June 28, she ate three birds, and was absent five times, which altogether amounted in duration to two hours and twenty minutes, when she may have eaten several other birds. The notes for that day show that the prey was: in the forenoon at 8.15 o'clock, a bird, which was eaten by the mother Hawk, as likewise was the bird brought at 10.07; at 11.30, a bird, taken to the nest, and in the afternoon at 3.01 o'clock, a meadow mouse, taken to the nest; at 4.00, a bird, eaten by the mother; at 6.55, a meadow mouse, which was taken to the nest as was the sparrow brought in at 7.17 o'clock. It is most likely that the father Hawk brought a piece of game early in the morning, and another piece about one o'clock in the afternoon, when for an hour observations were suspended. At noon that day the aggregate weight of the four hawklets was 7648 grains, and it was 8166 grains at half past seven in the evening, a difference of 518 grains, the known supply of food having been two meadow mice and one small sparrow. In the forenoon of June 25 there was brought to the young three half-grown ground squirrels and a bird.

At different times the character of the game varied; for a time nothing but ground squirrels was seen, followed by two days and a half when, excepting one squirrel, birds only were brought in, and this was succeeded by a similar period when only meadow mice were seen. It would appear from this that the male Hawk found a brood of young birds or mammals and hunted in their neighborhood until he had exterminated the whole brood. Confirmatory of this was a succession of four birds about equal in size, whose bodies resembled in shape those of young Brown Thrashers or Robins just out of the nest. After June 14 the identified quarry consisted of seventeen birds and nineteen mammals; of the latter eight were meadow mice and the rest ground squirrels. Besides these there were nine unidentified pieces, several of them apparently insects, that were fed the young after they left the nest. The tarsi of the eight bird victims found in the nest were sent to Washington, D. C., where Mr. E. R. Kalmbach and Mr. H. C. Oberholser very kindly identified them for me. Six of the eight were pronounced to belong to sparrows.

According to the economy of these Hawks incubation, the brooding and the feeding of the young, and the guarding of the nest was the part of the female, while the male hunted for the family; only once was he seen in or near the nest. A few times he circled overhead and joined in the screaming, when I was near the nest, his notes sounding thinner and in a higher key than those of his mate. At such times the female made a great commotion with her screaming and flying at me, notwithstanding all her noise and bluster she was an arrant coward, never coming nearer than four or five feet of my head. With a hundredth part of the provocation a Red-winged Blackbird or a Brown Thrasher would have hit, perhaps hurt a trespasser on its domain. After a time the female recognized me and began to scream, while I was still distant and nearly hidden by trees. The neighbors said that they knew when I appeared out of doors from the screaming of the Hawk. Other people, men, women, and children daily frequented the enclosure in which stands the bird blind, but her screams were reserved for me alone. To guard the nest she sat in the dead willow. In April both of the pair sat in the top of the tree, during incubation and the earlier days of the young the branches extending from the middle of the tree were used, and during the last ten days of the nest the top branches were again occupied.

Hunting was done for the most part to the southwest, the land there being devoted to farming, while the buildings of our decadent hamlet are situated in the other directions. Immediately to the southwest of the hawk tree lay an eighty acre cornfield abounding in ground squirrels. Not a tree nor a bush intervenes between this tree and the nearest farm yard a half mile away. Sitting on her lofty perch the female often spied her mate while he was still afar off, and with much screaming flew to meet him, and secure the prey he bore in his talons. Sometimes the meeting was no more than two or three hundred feet from the tree, but it was impossible to see her manner of seizing the quarry. Sometimes the male, still holding the prey, dashed by her to the tree, where still screaming she secured it. Once a ground squirrel retaining its head was brought in, all others were beheaded ones. The birds, headless, tailless, and wingless, were well plucked, yet the mother bird appeared to find some work to do on them before she delivered them

to the nest with scarcely the smallest feather remaining on them. Sometimes she skinned the ground squirrels, the nestlings ate the skins when she omitted the operation. The meadow mice were not skinned, but she always spent several minutes plucking out the hair, nevertheless much remained when taken to the nest. After she had snatched the prey from her mate, she usually uttered whine-like screams for two or three minutes before beginning her work on it. Crotches or peeling bark on the tree afforded her three or four places suitable for her flaying. In moving from place to place she sometimes carried the prey in her talons, but generally in her beak, and always thus when she flew from tree to nest. This flight she never made directly from her skinning places, but always descended to the lower branches of the willow by a series of short flights before starting for the nest; this she never did so long as she saw herself watched.

More vociferous screams than usual greeted my first appearance on the morning of June 28, awakening suspicions which were confirmed by a visit to the nest, and finding there that Moses had his head out of the entrance hole. After that hour one fledgling or another sat in the hole most of the time, shutting out the light and the fresh air. The weather was very hot, and the nest exceedingly filthy, yet that it was still "home, sweet home," to the hawklets was attested by the alacrity with which they hopped into it when held before the door. Jeremiah, the first born, marked by a red string on his foot, left the nest in the forenoon of June 30, some time between a quarter past eight o'clock and noon; and Ruth followed early the next morning. Frantic screams of the mother attended my search for Ruth. Very unlike the crouching, bustling, menacing creature of the previous evening was the very erect and slim little bird found perching in a willow sapling about fifty feet from the nest; and it was a gentle, farewell nibble that she gave the extended finger. Moses left the nest early in the morning of July 2, and Jezebel between five o'clock and half past that hour of the succeeding morning.

For a week the Hawks, old and young, staid about their tree. On the morning of July 11, the other birds sang a halleluiah chorus in the dead willow, that had been held by the Hawks for ninety-nine days; and no one could help wishing that the last had been

WEIGHT OF SPARROW HAWKS IN GRAINS.

Egg.	No. 2.	No. 4.	No. 5.	No. 6.	Daily average weight.
Weight. When fresh.[1]	227	225	228	204	
On June 4.	—	186	192	174	
	Jeremiah.	Ruth.	Jezebel	Moses	
1[1]	154	157			
2	189	168	166		
3	253	229	191	139	203
4	363	325	248	180	279
5	465	421	365	233	371
6	632	559	520	330	510
7	786	695	621	424	631
8	898	804	755	559	754
9	1073	1002	918	711	926
10	1217	1150	1093	840	1075
11	1276	1230	1169	942	1154
12	1471	1339	1310	1076	1299
13	1586	1517	1391	1205	1424
14	1686	1641	1627	1307	1565
15	1720	1709	1704	1438	1642
16	1735	1770	1757	1495	1671
17	1757	1808	1795	1616	1744
18	1804	1856	1938	1512	1777
19	1771	1898	1818	1600	1771
20	1831	2000	2038	1811	1920
21	1848	1940	2006	1598	1848
22	1815	2050	2056	1740	1915
23	1809	1992	1988	1685	1868
24	1800	2040	2072	1761	1918
25	1749	2073	2090	1736	1912
26	1784	2036	2055	1680	1888
27	Left nest	2060	2062	1684	
28		Left nest	2069	1678	
29			2176	Left nest	
30			Left nest		

[1] Days in the lives of the Sparrow Hawks.

seen of the Sparrow Hawks, but they were not so obliging. During the next two weeks occasionally one or two of them came to the old tree. Not infrequently until the last of September three of them together were seen elsewhere. In the case of some other species it has been noted that sometimes the brood was divided, the father bird taking part of them some distance from the place in which the mother cared for the others. It remains for future investigations to decide whether the father Sparrow Hawks takes the males under his guidance, and the mother Hawk the females; whether the advocates of the system of segregation of sexes in education can claim a praise-worthy precedent in the practices of the Sparrow Hawks.

In the two months they remained in the neighborhood after leaving our place the Hawks were seen most frequently about the nearest farm yard to the northwest, about the county fair grounds, and on the public school grounds. At the last named place on several occasions they were seen to perch on the brackets of the cornice of the schoolhouse. Twice the days were rainy, and the birds may have returned for shelter to their accustomed roosting places.

ADDITIONAL NOTES FROM THE MOUNTAINS OF WESTERN NORTH CAROLINA.

BY FRANCIS M. WESTON, JR.

DURING the first three weeks of September, 1912, while staying in the mountains of Transylvania County, N. C., I was able to devote some of my time to the study of the bird life of the section. The results of this study may be of interest when taken in connection with the excellent paper published by Messrs. S. C. Bruner and A. L. Feild (Auk, XXIX July, 1912, pp. 368–377).

The greater part of my field work was done in a restricted locality

in the lower part of the Davidson River valley about a mile and a half west of the railroad station of Pisgah Forest, and three miles north of Brevard. The valley at this point is at an elevation of about 2200 ft., and is enclosed between hills and low mountains. A few miles farther to the west, the mountains increase in size, attaining an elevation of 6000 ft. on the line between Transylvania and Haywood Counties. This ridge of high mountains is known locally as the "Balsams." The only peak of this ridge which I visited is Silver Mine Bald (6040 ft.), one of the twin peaks of Chestnut Bald.

In June, 1911, Messrs. Bruner and Feild walked for a month through the mountains of western North Carolina; and their concise, tabulated account was of great service to me. Their work was, of course, far more complete than mine, as other duties often prevented my being in the field more than a few hours a day. In consequence, they noted twenty-three species which I did not find; and described as common many species which, from the negative evidence of my notes alone, may be considered rare. However, my work was done in a month when most birds are silent as well as shy.

After the breeding season, it is probable that many species may wander several hundred feet above or below their breeding ranges; and it is not surprising that, in a few cases, I found birds some distance above or below the limits noted by Messrs. Bruner and Feild. This same reason may account for my having found thirteen species which they do not mention. These are: Pied-billed Grebe, Spotted Sandpiper, Sharp-shinned Hawk, Osprey, Pileated Woodpecker, Red-headed Woodpecker, Nighthawk, Red-winged Blackbird, Barn Swallow, Loggerhead Shrike, Worm-eating Warbler, Pine Warbler, and Redstart.

On former trips — viz., Hendersonville, Transylvania County, July 15 — Aug. 3, 1907; and Cashiers Valley, Jackson County, Aug. 4–19, 1907 — I noted four species which I did not find on the 1912 trip, and which are not mentioned by Messrs. Bruner and Feild. These are: Black Vulture, Great Horned Owl, Yellow-billed Cuckoo, and Blue-grey Gnatcatcher.

The following extract from my notes includes only those species for which my records differ from those of Messrs. Bruner and Feild, and the species which were not noted by them.

1. **Podilymbus podiceps**. PIED-BILLED GREBE.— Two Grebes were seen on Lake Toxaway (3000 ft.) on Sept. 9, and one above the mill dam on Davidson River (2200 ft.) on Sept. 13.

2. **Florida cærulea cærulea**. LITTLE BLUE HERON.— I was told on good authority that small white Herons were seen from time to time along the Davidson River. Although I did not see any, I feel confident that they must belong to this species.

3. **Butorides virescens virescens**. GREEN HERON.— A single Green Heron was seen on Davidson River (2200 ft.) on Sept. 13. In 1907, I saw two at Hendersonville (about 2100 ft.). Messrs. Bruner and Feild did not find this species above 2000 ft. in June, 1911.

4. **Actitis macularia**. SPOTTED SANDPIPER.— On Sept. 6, I saw two birds of this species feeding along the banks of Davidson River. This Sandpiper was found by Messrs. Bruner and Feild in the mountains of eastern Tennessee, but was not observed in North Carolina.

5. **Catharista urubu**. BLACK VULTURE.— In Hendersonville in 1907, I found quite a number of Vultures. They were generally seen singly, but sometimes in flocks of five or six.

6. **Accipiter velox**. SHARP-SHINNED HAWK.— Several of these Hawks were found in the Davidson River valley on and after Sept. 13. On Sept. 18, I saw two on the top of Silver Mine Bald (6000 ft.).

7. **Pandion haliaëtus carolinensis**. OSPREY; FISH HAWK.— On each of two days — Sept. 3 and 17 — I saw a Fish Hawk in the Davidson River valley (2200 ft.).

8. **Bubo virginianus virginianus**. GREAT HORNED OWL.— In 1907, I twice heard the call of this Owl at Hendersonville. Although I did not see any, I heard that one was taken a few days after I left there.

9. **Coccyzus americanus americanus**. YELLOW-BILLED CUCKOO.— In 1907, I saw one Cuckoo at Hendersonville and two in Cashiers Valley. Several were heard calling.

10. **Dryobates pubescens medianus.** DOWNY WOODPECKER.— Fairly common in and near the cleared lands of the Davidson River valley. One was found on the side of Silver Mine Bald (5200 ft.), several hundred feet higher than Messrs. Bruner and Feild noted the species in June, 1911.

11. **Phlœotomus pileatus (abieticola?)**. PILEATED WOODPECKER.— The few that were seen were near the cleared lands of the valleys. None were noted above 3300 ft.

12. **Melanerpes erythrocephalus**. RED-HEADED WOODPECKER.— On Sept. 9, one was seen in the fields of the French Broad River valley at an elevation of about 2100 ft.

13. **Chordeiles virginianus virginianus**. NIGHTHAWK.— On each of two days, a few were seen in the Davidson River valley. A few were seen near Hendersonville and two in Cashiers Valley in 1907.

14. **Cyanocitta cristata cristata**. BLUE JAY.— Abundant in the Davidson River valley. I found Jays common about our camp on the side of Silver Mine Bald (5200 ft.), and saw a few at the top of the mountain

(6000 ft.). In June, 1911, Messrs. Bruner and Feild did not observe this species above 5000 ft.

15. **Agelaius phœniceus phœniceus**. RED-WINGED BLACKBIRD.— This species was twice noted at Hendersonville in 1907, and once in the Davidson River valley in 1912.

16. **Astragalinus tristis tristis**. GOLDFINCH.— Abundant in the Davidson River valley. One was heard on the side of Silver Mine Bald (5200 ft.) — several hundred feet higher than Messrs. Bruner and Feild noted the species in June, 1911.

17. **Cardinalis cardinalis cardinalis**. CARDINAL.— Abundant in the Davidson River valley. On Sept. 18, I found Cardinals fairly common on the side of Silver Mine Bald (5200 ft.) — several hundred feet higher than Messrs. Bruner and Feild noted the species in June, 1911.

18. **Hirundo erythrogastra**. BARN SWALLOW.— On each of three days, I found Barn Swallows quite common about the railroad station of Pisgah Forest. None were seen after Sept. 11.

19. **Lanius ludovicianus ludovicianus**. LOGGERHEAD SHRIKE.— One Loggerhead was seen in Hendersonville in 1907, and a few near Pisgah Forest in 1912.

20. **Helmitheros vermivorus.** WORM-EATING WARBLER.— I found two of these Warblers in Cashiers Valley (3500 ft.) in 1907, and two in the Davidson River valley (2200 ft.) in 1912.

21. **Dendroica vigorsi**. PINE WARBLER.— One was seen in the trees bordering Davidson River (2200 ft.) on Sept. 10.

22. **Dendroica discolor**. PRAIRIE WARBLER.— I found this Warbler twice in the Davidson River valley: on Sept. 5 at 2200 ft., and on Sept. 16 at 2300 ft. Both of these records extend the range of this species as observed by Messrs. Bruner and Feild in June, 1911.

23. **Oporornis formosus**. KENTUCKY WARBLER.— On Sept. 12, I saw two of these handsome Warblers on the banks of the Davidson River (2200 ft.) In June, 1911, Messrs. Bruner and Feild did not find this species above 2000 ft.

24. **Setophaga ruticilla.** REDSTART.— In July and August, 1907, I saw one of these birds at Hendersonville and three in Cashiers Valley. In Sept., 1912, I found them fairly common everywhere in the Davidson River valley. On Sept. 18, a number were seen on the top of Silver Mine Bald (6000 ft.).

25. **Nannus hiemalis hiemalis**. WINTER WREN.— On Sept. 8, I saw a Wren of this species in deep woods at an elevation of 3200 ft. In June, 1911, Messrs. Bruner and Feild did not note it below 4000 ft.

26. **Polioptila cærulea cærulea**. BLUE-GRAY GNATCATCHER.— One Gnatcatcher was seen in Cashiers Valley in August, 1907.

27. **Hylocichla mustelina**. WOOD THRUSH.— On Sept. 18, I found a Wood Thrush in the deep woods on the side of Silver Mine Bald (5200 ft.). This is several hundred feet higher than Messrs. Bruner and Feild noted this species in June, 1911.

SOME NORTH AMERICAN BIRDS IN PANAMA.

BY L. L. JEWEL, C. E.

DURING the greater part of 1911 and up to September, 1912, the author lived at Gatún, Canal Zone, and nearly all Sundays and holidays during this period were spent in collecting and studying native birds. Naturally, many birds of the A. O. U. Check-List were observed, some resident in Panama and some transients or winter visitors. After July, 1911, records of the occurrence of such have been kept as completely as available time would allow. In many cases specimens were taken as recorded in the annotated list following.

Gatún is situated seven miles inland and directly south of Colón, at the beginning of what are practically the first foot hills of the Isthmus. The coast-line swings so far in just west of Colón, however, that only three or four miles of low flat land — some of it very marshy — separates Gatún from the bay. Indeed, salt water now comes up the old French canal, the East Diversion and the new American canal, to the very door of Gatún.

The valley of the Rio Chagres is here about a mile and a half wide and is now, of course, filled across by the Gatún locks, dam and spillway. This construction work has destroyed much cover, but on the other hand, the clearings made in and about the town of Gatún and the partial filling of Gatún lake have perhaps made the locality more attractive to certain migrant birds from the north.

To the south of Gatún the ridges diverge rapidly with miles of the Black Swamp country stretching between them and only a few thickly grown knolls less than one hundred feet high scattered here and there. Practically all of these will be submerged when the lake is altogether filled.

The higher hills on either side of the valley at Gatún, are about two hundred and fifty feet above sea level, with a few points reaching to twice that elevation.

Just three miles south of Gatún on the old line of the Panama Railroad, and in the heart of the Black Swamp country is, or rather was, Loma de Leon, or Lion Hill. It is now accessible only by

canoe and will soon be lost under the rising waters of Gatún lake. Thus passes perhaps, the foremost land-mark of Middle American ornithology.

In presenting the dates for the species given below, attention might be called to the very short time which some northern birds are absent from the tropics.

The Spotted Sandpiper (*Actitis macularia*) for example, is recorded in every month of the year, except May and June, and this by intermittent observance covering but little more than one year's time. It is, of course, probable that some few individuals of this species may fail to join the northward movement, and for some reason or other, spend the entire breeding season in the tropics; but the arrival of apparently healthy birds in early August, indicates how quickly the return trip is made after the family is reared.

The Semi-palmated Plover (*Ægialitis semipalmata*) is still earlier in making the return trip, some arriving on the Isthmus shortly after the middle of July.

Along with the group of early Shore Birds and Swallows, is another Passerine bird which arrives in Panama while it is yet summer in the temperate zone. This is the Yellow Warbler (*Dendroica æstiva æstiva*) which certainly may be found in Panama in every month but June and July. This means that long before the last birds have left the breeding grounds in the northern United States, the advance guard is in Panama. Again, in the spring, when first arrivals are choosing nesting sites as far north as New England many of their kind are still flitting and feeding among the mangoes and guavas three thousand miles southward. Certainly a remarkable distribution.

All birds of the A. O. U. Check-List which were identified with certainty, are included in the following list. For several identifications of subspecies, I am indebted to Mr. W. W. Grant of Englewood, N. J., and Mr. W. de Witt Miller of the American Museum of Natural History.

1. **Larus atricilla**. LAUGHING GULL.— A single individual was seen at the mouth of the old French canal near Colón on December 10 and three more at the same place on December 13, 1911.

2. **Sterna hirundo**. COMMON TERN.— One bird of this species was shot from a flock of the following at Gatún, on December 3, 1911. A single bird was taken on Gatún lake on June 9, 1912.

3. **Hydrochelidon nigra surinamensis**. BLACK TERN.— A few frequented Gatún lake from December 3 to 13, 1911. One specimen taken.

4. **Anhinga anhinga**. WATER TURKEY.— Sparingly resident in the Gatún lake district.

5. **Pelecanus occidentalis**. BROWN PELICAN.— Fairly common on the Atlantic side. Have also seen them on Gatún lake.

6. **Pelecanus californicus**. CALIFORNIA BROWN PELICAN.— Common on the Pacific side.

7. **Fregata aquila.** MAN-O'-WAR BIRD.— A common resident, especially on the Pacific side.

8. **Anas platyrhynchos**. MALLARD.— Seems to be a rare visitor. One seen on a small lake near Miraflores (Pacific side) on November 26, 1911. Only record.

9. **Querquedula discors**. BLUE-WINGED TEAL.— Probably the earliest migrant duck to arrive in Panama. First record is October 14, 1911. A week later it was abundant and for awhile continued so in the marshes around Mindi. Several stomachs were examined and the contents consisted largely of a small round green unknown seed. The flesh was excellent. On one occasion, I found three birds standing leg deep in the soft hydraulic fill of Gatún dam. The last record is February 7, 1912, but the species was abundant only through November, most of the birds apparently going on into South America.

10. **Marila affinis**. LESSER SCAUP DUCK.— A very abundant duck on Gatún lake during the winter months. The earliest record is November 25, 1911, and the latest is March 25, 1912.

11. **Ajaia ajaja**. ROSEATE SPOON-BILL.— One seen at Gatún in November, 1911. Probably a rare resident.

12. **Ardea herodias herodias**. GREAT BLUE HERON.— One positive record on October 29, 1911. This bird was seen at Mindi and inspected closely. In fact, it seemed very reluctant to take wing and only did so after repeated approaches to probably 30 feet. Other records were made at various times, but on June 9, 1912, a heron was shot on the Gatún River which is clearly another species — or at least, another form. I therefore feel some doubt as to all records for this bird, except the one given above, and believe there is a resident heron in Panama entirely distinct from the present species, being slightly smaller and without any rufus on the thighs. So far as I am now aware, it is as yet undescribed.

13. **Egretta candidissima candidissima.** SNOWY EGRET.— One specimen taken at Mindi on September 1, 1912. Probably a rare resident.

14. **Hydranassa tricolor ruficollis**. LOUISIANA HERON.— Sparingly resident.

15. **Florida cærulea cærulea**. LITTLE BLUE HERON.— The most abundant member of the family in Panama. The great majority of the birds are however white. There must be twenty white ones to each blue, with occasionally one of mixed plumage.

16. **Nycticorax nycticorax nævius**. BLACK-CROWNED NIGHT-HERON.

— One specimen taken at Mindi on October 29, 1911. An immature female.

17. **Porzana carolina**. SORA.— On October 1, 1911, Mr. Harry Ferguson of Toro Point shot and presented to me for preservation, a bird of this species. It was, at high noon on a bare coral beach, in the shadow of a high rock cliff, up which it was attempting to climb. Several birds were seen on October 7 and again October 14, 1911, at Mindi.

18. **Ionornis martinica.** PURPLE GALLINULE.— A common resident.

19. **Gallinula galeata**. FLORIDA GALLINULE.— Probably rare. One recorded January 18, 1911.

20. **Himantopus mexicanus**. BLACK-NECKED STILT.— From November 4 to 11, 1911, it was reported to me daily that " a funny snipe with a black back and red legs " was feeding in the west valley of Gatún Dam. I went out and took it on November 11. Except that it was not a snipe, that its back was not black and its legs not quite red, the description was fairly accurate. No others have been recorded.

21. **Gallinago delicata**. WILSON'S SNIPE.— Abundant for a few weeks during October and November. They become much less abundant in December but some birds remain all winter while greater numbers pass on southward. The earliest record is October 7, 1911 and the last January 7, 1912.

22. **Pisobia maculata**. PECTORAL SANDPIPER.— This bird is abundant in the grassy marshes about Mindi for a short period. Dates October 7 to 22, 1911.

23. **Pisobia minutilla.** LEAST SANDPIPER.— These dainty little birds are perhaps the most abundant sandpiper in Panama, except *Actitis macularia*. One was taken at Toro Point on September 4, 1911, and again on August 23, 1912. Last one seen in spring at Gatún, February 18. A large flock spent the entire winter in the hydraulic fill of Gatún Dam.

24. **Ereunetes pusillus**. SEMI-PALMATED SANDPIPER.— Found sparingly with the preceding species. September 4, 1911, to February 22, 1912, are extreme dates for the season.

25. **Totanus flavipes**. LESSER YELLOW-LEGS.— A single specimen of this species was taken at Gatún on August 27, 1911. The next record is October 7, but after that date, it was abundant for some four weeks. November 30 is the last record until March 3, 1912, when one individual was seen.

26. **Helodromas solitarius solitarius.** SOLITARY SANDPIPER. An abundant visitor. September 9, 1911, and September 1, 1912, are fall dates. The last bird was seen February 25, 1912.

27. **Bartramia longicauda**. UPLAND PLOVER.— This species arrived in Gatún, September 12, 1911, and was not rare until December 8, when the last bird was seen. In 1912, the first bird was seen on September 1. For weeks they were in, and around, Gatún daily, feeding and even roosting at the very doors of the quarters. Often at night, they could be heard to cry out in apparent alarm and then trail off into their peculiar soothing notes of content as they were answered by others near.

28. **Tryngites subruficollis**. BUFF-BREASTED SANDPIPER.— One of a pair was taken in a high, dry, pasture near Gatún, on October 18, 1911. Another was seen in the same location on March 29, 1912. Two records only.

29. **Actitis macularia**. SPOTTED SANDPIPER.— This species is present in Panama in all months of the year, except perhaps, May and June. August 31, 1911 and August 4, 1912 are fall dates, and April 24, 1911 and April 28, 1912 are extreme spring dates of departure.

30. **Numenius hudsonicus**. HUDSONIAN CURLEW.— One of the bird surprises of my life was to see a Hudsonian Curlew tip-toe and catch butterflies within twenty feet of my front door at Gatún. The clearings in and around the town seemed very attractive to these birds and they were fairly tame. Marching or advancing by rushes, always with graceful dignity, sometimes singly but more often in groups of four or five, they foraged through the shorter grass, picking up or catching on the wing their insect food. They usually kept near the water's edge or well down in dry gullies but also fed on higher ground at times. The earliest record is of October 1, and the last, November 3, 1911.

31. **Oxyechus vociferus**. KILDEER.— First record, November 26, 1911 and the last, March 3, 1912. This is the only bird of the shore-bird group more abundant in late winter than earlier, which would seem to indicate that Panama is nearly the southern limit of its range.

32. **Ægialitis semipalmata**. SEMIPALMATED PLOVER.— The earliest record for this bird is July 23, 1911,— a flock of seven at Toro Point. On August 4, 1912, I visited there again, and found them abundant. January 28, 1912, is the last record.

33. **Catharista urubu**. BLACK VULTURE.— A common resident.

34. **Circus hudsonius**. MARSH HAWK.— This is a common winter visitor. October 24 and April 18, 1911 and 1912 are the extreme dates.

35. **Buteo swainsoni**. SWAINSON'S HAWK.— A female of this species was taken at Gatún on December 8, 1911. The skin was given to Mr. E. A. Goldman to whom I am indebted for confirmatory identification.

36. **Buteo platypterus**. BROAD-WINGED HAWK.— The most common migrant hawk in Panama, but is less in evidence than *Circus hudsonicus* or *Falco sparverius* because it usually stays well in the forest. Specimens have been taken, but extreme dates are not recorded.

37 **Falco sparverius sparverius**. SPARROW HAWK.— A common winter visitor around the towns. Extreme dates October 24 and April 5, 1911 and 1912. During this period, they were in almost daily evidence about Gatún. Have heard them call repeatedly as if it were nesting-time back home.

38. **Crotophaga ani.** ANI.— I had expected to find *C. sulcirostris* here but have seen none. This species is one of the most abundant of resident birds.

39. **Coccyzus americanus americanus**. YELLOW-BILLED CUCKOO. — Two records October 22 (specimen) and November 3, 1911.

40. **Ceryle alcyon alcyon**. BELTED KINGFISHER.— Not common. October 1 to March 3 are extreme dates.

41. **Ceryle torquata**. RINGED KINGFISHER.— A fairly common resident.

42. **Ceryle septentrionalis isthmicus**. ISTHMIAN KINGFISHER.— An abundant resident which is included in this list because the range of *americana* is given in the Check-List as south as Panama. This form was separated only last year by Mr. E. A. Goldman.

43. **Chordeiles virginianus virginianus**. NIGHTHAWK.— I do not believe this species winters in Panama. Numbers pass through September 11 to November 29. Specimens taken, October 23. Other dates may, of course, apply to other forms.

44. **Chordeiles acutipennis texensis**. TEXAS NIGHTHAWK.— A pair was taken at Gatún on December 10, 1911.

45. **Amizilis tzacatl tzacatl**. RIEFFER'S HUMMINGBIRD.— The most common member of the family at all seasons.

46. **Tyrannus t. tyrannus**. KINGBIRD.— A rare winter visitor. No extreme dates recorded.

47. **Tyrannus dominicensis**. GRAY KINGBIRD.— Rare. Specimen taken February 14, 1912. May breed sparingly.

48. **Myiarchus crinitus**. CRESTED FLYCATCHER.— A few winter. No extreme dates.

49. **Myiochanes virens**. WOOD PEWEE.— Not uncommon during the winter months. My earliest date is October 15 and the latest is January 14. It is not a silent migrant.

50. **Myiochanes r. richardsoni.** WESTERN WOOD PEWEE.— I have one specimen taken April 4, 1911. I have never seen another bird of the species.

51. **Empidonax flaviventris**. YELLOW-BELLIED FLYCATCHER.— I am not familiar with this species, but have one bird taken January 1, 1912, which I believe belongs here.

52. **Empidonax t. trailli**. TRAILL'S FLYCATCHER.— I took one bird of this species on January 14, 1912. Have no other record.

53. **Icterus spurius**. ORCHARD ORIOLE.— I have seen this bird only in the spring and late winter. It is not common. My earliest record is February 18, 1912 and the latest, March 4.

54. **Icterus galbula**. BALTIMORE ORIOLE.— Have seen this bird but once — when I took a male just acquiring breeding plumage, on February 22, 1912. He was in a large tree on bank of the Rio Chagres with several of preceding species. I looked carefully, but could find no others.

55. **Megaquiscalus major macrourus**. GREAT-TAILED GRACKLE— A not uncommon resident on the Pacific side of the Isthmus, but less common on the Atantic side.

56. **Spiza americana**. DICKCISSEL.— Common for about a week or ten days in March. My earliest record is March 6 and my latest, April 5. I have never seen the bird except during the period mentioned.

57. **Piranga erythromelas**. SCARLET TANAGER. — Have seen but one, March 16, 1911.

59. **Progne chalybea**. GRAY-BREASTED MARTIN.— A common resident. Breeds in holes in trees and has also learned to nest within the iron ridge rolls of corrugated iron roofs.

59. **Hirundo erythrogastra**. BARN SWALLOW.— This bird is abundant in both fall and spring but rare in mid-winter. My earliest record is August 23, 1911. Within a week they were abundant and were seen daily until December 5, when they rapidly disappeared. January and February are without a record. On March 17 they reappeared to become again common for six weeks or perhaps less. My last record for 1912, is May 26, when I recorded several. On May 30, 1911, I shot one from a flock of *Iridoprocne albilinea*. It will thus be seen that their local schedule is roughly three months on, and three months off — passing twice in the year.

60. **Riparia riparia**. BANK SWALLOW.— Fairly common for two months in the fall, but much less so in the spring. My earliest record is September 23, 1911, and the latest is November 30, 1911, except a small flight on February 22, 1912.

61. **Mniotilta varia**. BLACK AND WHITE WARBLER.— One specimen of this species was taken on March 26, 1911, the only one I have seen. It was with one Redstart and several Yellow Warblers.

62. **Protonotaria citrea**. PROTHONOTARY WARBLER.— My earliest record for this beautiful species is October 1, 1911. It was occasionally seen until in late November, but I have no December record. The last date is January 29.

63. **Vermivora chrysoptera**. GOLDEN-WINGED WARBLER.— A very rare visitor in my experience. My only certain record is March 10, 1911.

64. **Dendroica æstiva æstiva.** YELLOW WARBLER.— By far the most abundant representative of the family here. I have one female taken August 29, 1911, and one taken August 18, 1912. From late September until the end of the year, I found them common. They are less so in January and February, but are again common in March. My last record is May 12, 1912. Thus one year's record shows an entire absence of this species of but little more than three months. Before the last birds leave this latitude for their breeding range, the first ones are in Nova Scotia, Manitoba and British Columbia.

65. **Dendroica pensylvanica**. CHESTNUT-SIDED WARBLER.— This species is not rare here during the winter months. My earliest record is November 26 and the last is March 31.

66. **Dendroica castanea**. BAY-BREASTED WARBLER.— This is not a rare migrant in November and December. My earliest record is November 3, 1911, and my last is January 1, 1912.

67. **Seiurus aurocapillus**. On November 26, 1911, while hunting in a thicket near Gatún, I heard the familiar call-note of this bird. I answered and called the bird to me. Have seen no other than this specimen.

68. **Seiurus noveboracensis noveboracensis**. WATER-THRUSH.—

A common winter visitor. My extreme dates are October 15, 1911, and April 20, 1912.

69. **Seiurus motacilla**. Louisiana Water Thrush.— Not common. I have seen it here on October 29, 1911, and again on February 11 and 18, 1912 — a total of three records.

70. **Oporornis formosa**. Kentucky Warbler.— Not a common visitor, but perhaps more winter here than one would think from the number seen. They walk about in the heavy damp jungle, calling with the same unmistakable metallic chirp as they do in their breeding haunts. My earliest record is February 22 and the last is March 24, 1912.

71. **Oporornis philadelphia**. Mourning Warbler.— Being unable to accurately distinguish between this species and *tolmei* in the field, I can record with certainty, only two dates for this bird. One male taken at Gatún on April 7 and another on April 28, 1912. It (or *tolmei*) is not rare in October and November and again throughout April.

72. **Wilsonia canadensis**. Canadian Warbler.— I have seen but one bird of this species. A male taken at Gatún on April 28, 1912.

73. **Setophaga ruticilla**. Redstart.— Not uncommon at times. My earliest record is October 1, 1911, and the last is March 31. The longest interval without a record is January 1 to 23.

74. **Dumetella carolinensis.** Catbird.— On February 22, 1911, I saw three birds of this species near Gatún, but have seen it on no other occasion.

GENERAL NOTES.

Holbœll's Grebe (*Colymbus holbœlli*) **at Bedford, Mass.**— Feb. 15, 1913, Mr. William H. Simonds found a Holbœll's Grebe on the ice of Concord river. The bird was in good condition but apparently exhausted. It was brought to the village and identified and on the next day, the 16th, was carried back to the river bank and apparently there took care of itself and was *thought* to have been seen a day later in open water.— Charles W. Jenks, *Bedford, Mass.*

The Dovekie (*Alle alle*): **an Addition to the Fauna of South Carolina.**— I am indebted to my friend Dr. Leonard C. Sanford, for the gift of a beautifully mounted specimen of a male Dovekie, which was picked up dead off Beaufort, S. C., in February, 1909, and forwarded to him in the flesh. Mr. H. H. Brimley has recorded the abundance of this bird from Roanoke Island to Beaufort, North Carolina, in January, 1909.

This South Carolina record extends the range of this boreal bird more than two hundred miles to the southward, and is the second species of the Alcidæ recorded from the State.— Arthur T. Wayne, *Mount Pleasant, S. C.*

White Pelican in Colorado.— It is a satisfaction to believe that this species (*Pelecanus erythrorhynchos*) has really not deserted Colorado in its migrations and wanderings. The writer is informed by his old time hunting friend, Mr. W. B. Sheppard, of Fort Collins, Colo., that he saw seven individuals of this pelican on May 17, 1912, on a small lake near Niwot, Colo. While Mr. Sheppard is not even an amateur ornithologist, he is familiar with this species, having seen and studied it many times in the Yellowstone region, and the writer feels that this is a credible record, even if it be one made by sight identification.—W. H. Bergtold, *Denver, Colo.*

Hudsonian Godwit. A correction.— In 'The Auk' for April, 1913, the date of the godwits taken at the Magdalen Islands was given as February 18, 1911. This should have been September 18, and in view of their rarity it is perhaps worth while to make the correction.— W. E. Saunders, *London, Ontario.*

Little Blue Heron (*Florida cærulea*) **at Lynn, Mass.**— On April 29–, 30 a bird of this species was seen about a small overflowed bog on a farm known as the Fay estate, near the Salem line. The bird was very tame, and gave us fine opportunities for study; at times it was watched at a range of 200 ft. with a four power field glass. Points noted were the even slaty blue of the body above and below; the fine maroon tint on the head and neck; neck long and much less in diameter than that of the Green Heron; legs long, slender, and dark in color; bill blue next the head, black at point.

On April 30, it was also observed by Mr. Charles Norton.— Arthur P. Stubbs, *Lynn, Mass.*

The Whooping Crane (*Grus americana*) **in Nebraska.**— On October 16, 1912, four of these splendid birds were shot out of a flock of five at Wood Lake, Cherry county, Nebraska, by Mr. Henry T. Clarke, Jr., of Lincoln and a man named Quick who accompanied him. All four of the birds were mounted by Mr. August Eiche, of Lincoln. Three of the cranes were adults, two males and a female, while the fourth was a young female in the beautiful brown plumage. The latter specimen is in the collection of Mr. Eiche, while the others belong respectively to Messrs. Harry H. Harley, William H. Dorgan and Ex-Gamewarden H. N. Miller, all of Lincoln. A few days later, according to Mr. Miller, two more of these cranes were shot by hunters at Grand Island, Nebraska. According to their statements, these hunters mistook the birds for "brant" (*i. e.* Snow Geese). The two Grand Island birds were also mounted. I am indebted to Mr. Eiche for the above data.—Myron H. Swenk, *Lincoln, Nebraska.*

Stilt Sandpipers (*Micropalama himantopus*) **at Ithaca, N. Y.**— Following the cold rainy days of the first of August (1912) and coincident with the first flocks of migrating warblers, there occurred through central New York State a considerable migration of Shore Birds. Although a few

had been noted about two weeks previously, this was the first large migration of the fall. In mixed flocks along the head of Cayuga Lake, the following species were abundant: Semipalmated, Least and Pectoral Sandpipers, Sanderling, Lesser Yellow-legs and Killdeer Plover. In addition, Solitary and Spotted Sandpipers, feeding singly, were scattered all along the shore and likewise one Ring-necked Plover. Three days later, I found the same species in greater numbers, and associated with them, a flock of six Knots and one of seven Stilt Sandpipers. The number of Knots did not change, but the flock of Stilt Sandpipers shortly increased to eleven, although all were seldom seen at once. Two White-rumped Sandpipers, two Black-bellied Plovers, a Turnstone, a Greater Yellow-legs, and a Dowitcher soon added themselves to the assemblage. The majority of these birds were adults and still in nuptial plumage. They remained the greater part of a week, when most of them moved on, leaving only a small number of those species which had earlier been the most numerous.

The presence of such a variety of Shore Birds, including the Stilt Sandpipers, induced me to make somewhat extended observations. Accordingly a blind was constructed along the lake shore and many hours were spent in watching their movements. Inasmuch as the Stilt Sandpipers are so generally overlooked on the migration or confused with the Yellow-legs, a few comparative observations on their habits may be of interest.

Although they might have been actually more numerous, the largest number seen together at one time was eleven. Usually they were in groups of from two to six and mingled with the Yellow-legs. The adults of the two species were easily distinguished as many of the Stilt Sandpipers still retained more or less of the breeding plumage with buffy and rufous markings about the head, and heavy bars on the sides and flanks. The immature and molting birds of the two species, however, were much more easily confused for the Yellow-legs lacked the checker-board markings of the adult and approached very closely, in the back pattern, the mottling of the Stilt Sandpipers. The bars on the sides of the young Stilt Sandpipers being very faint, the two birds were therefore outwardly much alike. The color of the legs distinguished them, when these were visible, but when they waded in water an inch or more in depth, even this proved an uncertain criterion as the upper shanks of many of the Yellow-legs were dark. Again in flight, the birds were very similar, although the white rumps and tails of the Stilt Sandpipers seemed less conspicuous than those of the Yellow-legs. The difference in size when the two birds stood side by side was very appreciable but, at other times, was merely confusing.

In their habits, however, the two species were quite different. The Yellow-legs were always rangy birds and covered a great deal of ground while feeding. Even when resting they were conspicuous by the nervous jerking of the head and neck. In flight they usually formed fairly compact flocks but scattered upon alighting. The Stilt Sandpipers on the other hand, were quiet birds and went about their search for food very systematically, gleaning everything in their way. They frequently fed in a

space a few yards square for over an hour at a time. When at rest, they showed none of the nervous traits of the Yellow-legs, being much more sedate, neither jerking the head not tilting the tail. In flight they were quite similar to the Yellow-legs, but as soon as alighted, they bunched and frequently the whole flock fed with their bodies nearly touching.

Like the Yellow-legs, the Stilt Sandpipers were seldom seen upon the exposed mud but preferred wading where the water was from one to three inches in depth, so that the entire head and neck frequently disappeared beneath the surface of the water while feeding. The notes of the two birds though similar in form, were wholly unlike in quality, that of the Stilt Sandpiper being mellower and lower in pitch.— ARTHUR A. ALLEN, *Ithaca, N. Y.*

Unusual plumages of the Ocellated Turkey (*Agriocharis ocellata*).— Of many females of this turkey that have come under my observation, during three years residence in the southern and central parts of Campeche, Mexico, the plumages of three specimens demand special description. In all three of these birds, the first four of the inner secondaries have their exposed portions of an iridescent green, a subterminal bronzy bar, and the tips of grayish white. The inner secondaries have their exposed parts of a " pepper and salt " pattern, which is lightest on the extreme outer margins and the tips. Unexposed parts of these feathers — that is, the outer halves — are of a dull black, while their main stems are black. Inner halves of all the secondaries dull black at bases, passing to a soiled white on the margins with an inclination toward mottling at the ends.

Primaries clear, sooty black, being blotched with grayish white near bases, especially on the outer vanes.

The remainder of the plumage in these three birds is normal, while the above described departure therefrom, with respect to the wings, is so striking and so conspicuous that it commands the attention of the observer at once and under all conditions.

One of these abnormally plumaged individuals came into my possession alive, but was, unfortunately, killed and eaten by a large hawk a short time afterwards; the remaining two were shot and preserved. Of these, one was shot out of a flock numbering some fifteen or twenty birds on the 25th of September, 1912, it having immediately attracted my attention from the fact that its wing plumage was so different from that of the rest of the flock, all of which wore the normal plumage.

This specimen typifies the rare and unusual coloration described above, it having about completed the assumption of the second plumage, only the outer rectrices of the first plumage not having, as yet, been molted.

My remaining bird was collected on the 9th of November, of the same year, it being associated at the time with another female and two males, all of these last being normally plumaged individuals.

In the wing of this specimen, the first eight primaries of either side present a mottling of grayish white toward their tips. No explanation

has occurred to me for this unusual plumage in *Agriocharis ocellata* other than perhaps it may possibly be due to the prehistoric peoples that at one time densely populated this part of Mexico having domesticated these turkeys, and that some of these aborigines, through artificial selection, produced a variety of the species which, in the long years since those times, has again become mixed with the normal birds in nature, and is now reverting to their plumage.

As a rule, the species assumes and passes through its several plumage states with marked regularity and uniformity; and, as a matter of fact, aside from the three specimens above described and a few instances of partial albinism, no other abnormalities, with respect to this species, have come under my observation.

Apart from such a solution, to my mind it would seem that there is either some cause now operative — or in times past has been operative — which, were it discovered, would explain the necessity for this species to assume a less conspicuous plumage than the strikingly brilliant one which at present characterizes it.— Percy W. Shufeldt, *Campeche, Mexico.*

The Passenger Pigeon at the Cincinnati Zoölogical Gardens still living.— Many readers of Mr. Wells W. Cooke's very interesting and instructive paper, "Saving the Ducks and Geese" (The National Geographic Magazine, Vol. xxiv — Mch. 1913) have read with deep regret the announcement which he makes in reference to the Passenger Pigeon. He writes — "Today this bird is entirely extinct, the last survivor dying in the Zoo at Cincinnati a few days ago." After reading this sad news, I at once wrote Mr. S. A. Stephan, General Manager of the Cincinnati Zoölogical Co., asking for details and was delighted to receive the following reply under date of May 17. "I have your letter of May 16th, and beg to say that our one remaining Passenger Pigeon is still alive and in as good condition as when I wrote you on Oct. 3rd, 1912." — Ruthven Deane, *Chicago, Ill.*

Nesting of the Barn Owl in Illinois.— The first authentic set of Barn Owl's eggs for Illinois was taken May 20, 1909, in Champaign County by Guy Day of Sidney. This consisted of nine eggs and was collected in my ten-mile radius.

On April 20, 1913, I collected a second set of six eggs in the same Salt Fork creek bottoms nine miles from Philo. Both Owls were flushed from the cavity of an enormous Sycamore overhanging the creek.— Isaac E. Hess, *Philo, Ill.*

An Unusual Malady and Probable Cause of Death in a Toucan (*Ramphastos carinatus*).— An adult female of this toucan died April 24, 1913, at the establishment of Mr. Edw. S. Schmid of Washington, D. C., who kindly presented me with the specimen the same day. Upon examining its anatomy — an invariable practice of mine with such material before roughing out the skeleton — I found it in fair condition with most

of the general organs healthy. The bird was in the " pin-feather " moult, the ensheathed new feathers of the tail being each about an inch long. Upon removing the skin covering the uropygial gland, I at once observed that the left lobe of that structure was enormously enlarged, and the cause for this was not far to seek. Some superficial inflammation or other at the apex of one of the erupting quill-feathers of the tail on that side had prevented that particular quill from coming out. As it grew, it proceeded to coil upon itself beneath the skin, until two and a half coils had formed, like the coils of the shell of some snails, the transverse diameter of the whole structure being about a centimeter and a half. Apparently the disease was of some standing and the surrounding inflammation, due to the above cause, considerable, which latter — in part at least — may have had its share in causing the death of this bird. Years ago, in my surgical practice, I had a case or two where the hair of the beard in a man behaved in a similar manner, causing an abscess to form which, in one instance, was as large as a hazel nut, the coiled-up hair inside, which gave rise to the trouble, having a length of an inch or more.— R. W. SHUFELDT, *Washington, D. C.*

Road-runner in Colorado.— In the third supplement to Cooke's list of Colorado birds (Auk, Oct., 1910, p. 412), there is a record of this species (*Geococcyx californianus*) having been taken at Shawnee (altitude 8125 feet), Platte River, Colo., March 15, 1907.

The following narrative sheds an interesting side light on the possible circumstances bringing about such an unusual record, also giving one an inkling as to what might have occurred in other startling records.

A short time ago the writer was conversing with Mr. A. T. Allen, taxidermist of Denver whose shop he frequently visits, to see if any rare or uncommon birds had been brought in to be mounted. Mr. Allen mentioned the fact that he had mounted a Road-runner which had been brought in to him by Mr. J. W. Price, of Shawnee, Colo., who had shot the bird there on March 15, 1907, this date being a matter of record in Mr. Allen's day book. It seems a fair presumption that the bird recorded by Cooke, and the one just mentioned and mounted by Mr. Allen were one and the same. About a year after Mr. Allen had mounted this particular Road-runner, a customer came into his place of business, and purchased a mounted Road-runner, saying that he lived in the Southwest, where these birds are common, and that it had not occurred to him to take one (alive or mounted) east to show his friends, until he had stopped off on business at Denver, hence his purchase of the mounted bird. Further conversation between this customer and Mr. Allen lead the former to tell Mr. Allen that he had a year previously, spent considerable time in Denver, and at that time had with him a tame Road-runner. He kept this bird with him in Denver some time, and then liberated it " up in Platte Canyon " some time previous to March, 1907.— W. H. BERGTOLD, *Denver, Colo.*

Evening Grosbeaks (*Hesperiphona vespertina vespertina*) **at Manchester, N. H.**—On March 6, 1913, at 8 o'clock A. M., I saw seven Evening Grosbeaks in front of the Woman's Aid Home in Manchester, N. H. One was a brilliant male in full plumage, the others varying greatly. They were in a small mountain ash tree, sixteen feet from where I stood, but were not feeding while I watched them. Later in the morning I located them feeding in maple trees, about four blocks distant from the former location, one brilliant male and six others as before. I publish this note in the interest of the Manchester Institute of Arts and Sciences, other members of which have likewise observed grosbeaks recently.— EDWARD H. FOGG, *Manchester, N. H.*

An Abnormal Rose-breasted Grosbeak.— On May 15, some friends informed me that they had seen in this neighborhood a Rose-breasted Grosbeak (*Zamelodia ludoviciana*) with a yellow breast. Taking me to the place where they had seen it, in hopes that it might be nesting, it was found without difficulty. The color of the breast might be termed a light orange.— ROBERT BARBOUR, *Montclair, N. J.*

A Winter Record of the Brown Thrasher in Lancaster, Mass.— During this last winter (1912–1913) a Brown Thrasher (*Toxostoma rufum*) took up his residence in a Colorado Blue Spruce (*Picea pungens*) in front of my greenhouse and apparently had a very comfortable time of it. My gardener became very much interested and every day threw out food and also put the greenhouse cat to "rest."

The bird as far as I could see was not injured or crippled in the least. February 24 and 25, my man said he sang, but as a cold snap came on the 26th, he stopped and never tried it again all winter.— JOHN E. THAYER, *Lancaster, Mass.*

Two Rare Birds for Massachusetts.— I should like to record the recent occurrence in Lexington, Mass., of two birds, rare in eastern Massachusetts. Shortly before seven in the morning, April 26, 1913, a Carolina Wren (*Thryothorus ludovicianus ludovicianus*) passed rapidly northward through my yard, singing loudly. Soon afterward, Mr. Walter Faxon, from his house half a mile to the north, heard the song. An hour later, we followed the wren's northward course for nearly a mile until we overtook him, singing from a tangle of brush. From here he turned squarely to the west and, still in the brush, continued to an alder swamp where he dropped to the ground to feed and stopped singing. We found no further trace of the bird either late in the afternoon of the 26th or the next morning.

The second rarity, a Blue-winged Warbler (*Vermivora pinus*), visited my garden at 5 o'clock in the morning of May 6, 1913. He was in brilliant plumage, showing no trace of mixed blood. He sang from the top of a flowering plum tree the typical *pinus* song,—two drawling, buzzing notes. This bird arrived, doubtless, with the heavy migration wave of the previous

night which brought the orioles and most of the resident warblers, including the Blue-winged Warbler's relative, *V. chrysoptera*.

Mr. Faxon and I were especially interested in the presence of this warbler. In 'The Auk' for October, 1907 (p. 444), Mr. Faxon recorded a male Brewster's Warbler which had spent the preceding summer in Lexington, and in the Memoirs of Museum of Comp. Zool., 1910 (XL, pp. 57–78), he gave a detailed account of two female Brewster's Warblers which, mated with *V. chrysoptera*, bred during the summer of 1910, in the same locality where the 1907 bird was found. Brewster's Warblers have returned to this locality each year since 1910.

In plumage the offspring of all these birds have followed the laws of Mendelian heredity and the inference is that *V. pinus* has bred on some former occasion in the vicinity and that these Brewster's Warblers are a relic of cross breeding. However, with the exception of "A nesting of the Blue-winged Warbler in Massachusetts," by Horace W. Wright (Auk, XXVI, No. 4, October, 1909) in Sudbury, twenty miles to the south, there was, until now, no record of the occurrence of *V. pinus* for this immediate region. The appearance this spring of a pure Blue-winged Warbler within half a mile of the Brewster's breeding ground is a bit of corroborative evidence that from time to time *pure* blood may be introduced into eastern Massachusetts.

Mr. Faxon and I believe that the present bird cannot have been a descendant of a local *V. leucobronchialis*, for the reason that, without exception, the Brewster's Warblers in Lexington sing the *V. chrysoptera* song.— Winsor M. Tyler, *Lexington, Mass.*

Birds Observed at Bennington, Vermont.— The following species have been noted by Mrs. Ross and myself during the past few years.

Colymbus holbœllii. Holbœll's Grebe.— 1904, Feb. 18, seven taken alive on the snow — unable to fly. 1910, Jan. 1, one taken alive. 1912, Feb. 12, one taken alive. 1913, Mar. 14, one taken alive.

Alle alle. Dovekie.— 1910, May 31, one taken alive but died the next day. It was mounted and is now in the State Museum at Montpelier. It was in summer plumage.

Sterna hirundo. Common Tern.— 1907, May 30, one seen.

Aythya marila. American Scaup Duck.— 1911, Oct. 25, one shot.

Harelda hyemalis. Old Squaw.— 1911, Nov. 13, one shot.

Rallus elegans. King Rail.— 1910, one spent the month of May in a swamp in this town.

Calidris arenaria. Sanderling.— 1911, Sept. 25, one taken alive but injured; lived only a few days. Mounted and is in the State Museum.

Limosa hæmastica. Hudsonian Godwit.— 1911, Sept. 5, one taken alive with a broken wing.

Aquila chrysaëtos. Golden Eagle.— 1911, Oct. 26, one shot — mounted and is in a private collection.

Corvus corax principalis. NORTHERN RAVEN.— 1909, Nov. 7, one shot — mounted and is in a private collection.

Hesperiphona vespertina vespertina. EVENING GROSBEAK.— 1909, a flock numbering between 30 and 40 remained in and about the village for about 3 weeks — were first seen April 1, last seen April 18. 1911. A flock of 5 were first seen March 27, and were seen three or four times for a week. 1913. A flock of 25 or 30 were first seen January 1, and have been seen many times by many observers on different dates — were last seen by myself April 20.

Passerherbulus henslowi. HENSLOW'S SPARROW.— Nested in 1909, 1911, 1912.

Dendroica tigrina. CAPE MAY WARBLER.— 1912, a large migration during May — the only migration observed in 10 years. One was found dead which was mounted and is in a private collection.

Icteria virens virens. YELLOW-BREASTED CHAT.— 1912, June, one pair nested.

Penthestes hudsonicus hudsonicus. HUDSONIAN CHICKADEE.— 1912, Dec. 26, one seen.—LUCRETIUS H. ROSS, M. D., *Bennington, Vermont.*

Some Birds of Southwestern Missouri.— Bewick's Wren (*Thryomanes bewicki bewicki*) prior to 1907 had not been listed from the western central section of Missouri. It was not seen by W. E. D. Scott, neither was it mentioned in Mr. Widmann's catalogue of Missouri birds issued several years ago. The species is apparently extending its range as the following notes would indicate.

May 30, 1907. Saw two specimens.

March 24, 1909. Saw and heard half a dozen Bewick's Wrens.

March 29, 1909. Saw Bewick's Wren to-day and have seen numbers since the 24th.

April 21, 1910. Saw one carrying twigs into a paste-board box on top of a trash heap. (The nest was destroyed later.)

April 2, 1912. Heard two or three to-day.

April 12, 1912. Have heard several each day since the 2nd.

April 27, 1912. Have heard several each day since the 12th.

May 19, 1912. Have heard them occasionally since the last record

June 3, 1912. Heard one to-day,— the only one since May 19.

June 22, 1912. Heard one to-day. (Must be nesting.)

March 20, 1913. Saw and heard one to-day.

May 21, 1913. Have seen and heard a number since March 20.

The Evening Grosbeak (*Hesperiphona vespertina vespertina*) has been considered a rare bird in Missouri. My first record is Jan. 31, 1911, when three males were seen. They were observed in varying numbers from three to thirteen a number of times, until April 27, the last record.

Red Crossbills were seen almost daily between the dates of February 23, 1911, and March 24, 1911. This was a small flock numbering only five or six.— A. F. SMITHSON, *Warrensburg, Johnson Co., Mo.*

Birds of the Headwaters of the Gila River, New Mexico: Further Records.— I desire to add three more species to the list published in Vol. XXIV, Auk, p. 327. All of these three species were taken at the G. O. S. Ranch, on Sapillo Creek, N. Mexico and are as follows:—

Astur atricapillus striatulus. WESTERN GOSHAWK.— One (♂) shot Oct. 7, 1912.

Archibuteo ferrugineus. FERRUGINOUS ROUGH-LEG.— One (♂) shot Oct. 14, 1912.

Calcarius ornatus. CHESTNUT-COLLARED LONGSPUR.— A moderate sized flock lingered in the grain stubble from Oct. 13, to (at least) Oct. 21, 1912.— W. H. BERGTOLD, *Denver, Colo.*

Double Bird Tragedy.— About eight o'clock May 6, 1913, painters working on a forcing house on the grounds of the New York Agricultural Experiment Station at Geneva, N. Y., were startled by the headlong flight past them of two birds. One was evidently frantic with terror from pursuit, the other conscious of nothing but its prey, for both birds rushed heedlessly past the men and after a flight of five or six rods more, dashed headlong into the plate-glass window of the residence of the Station Director, who, with his family, was away from home. The glass was not broken but the birds were both instantly killed, either by the shock or by breaking their necks. The concussion was heard by the forcing-house man at his work and he, with the painters, went to the place and picked up the birds. These were later identified by Mr. B. B. Fulton, Assistant Entomologist of the Station, as a Hermit Thrush and a Sharp-shinned Hawk, and the identification was later confirmed by the writer. The thrush is migratory here, the hawk resident but not abundant.— F. H. HALL, *Geneva, N. Y.*

Æsop as a Bird Observer.— Under the title of "Two ornithological fables from Louisiana" there appeared a note in 'The Auk' for April, 1913, p. 282, by W. L. McAtee, wherein two tales or fables relating to bird life were recited.

The first of these, concerning an alleged interesting fish-catching habit of *Mycteria americana*, is beyond the writer's power to verify. If the story, or at least the substance of it, be true, the easiest explanation at hand is that given by Mr. McAtee, i. e., that the scales allure small fishes in search of food and that these, rising to the surface in great numbers to nibble at the bait, are devoured by the Ibises.

The second tale, however, is of course to be relegated to the realm of myth and is as old as Æsop. As it is very beautiful and of great ethical importance in the proper education of good boys and girls, besides being of interest owing to its great antiquity, it deserves to be quoted in the original. The Latin is taken from an edition entitled "*Aesopi Fabulae Graeco-Latinae*," &c., Eton, 1807, II, p. 26, and is a model of brevity:

"Formica sitiens descendit in fontem, ac tracta a fluxu, suffocabatur.

Columba vero, hoc viso, ramum arboris decerptum in fontem projecit, super quo sedens formica evasit. Auceps autem quidam post hoc, calamis compositis, ad columbam comprehendam ibat. Hoc autem viso, formica aucupis pedem momordit; ille vero dolens, et calamos projecit, et, ut columba statim fugeret, auctor fuit. Affabulatio: Fabula significat, opertere benefactoribus gratiam referre."

Which, freely translated, reads about as follows:

An ant, being thirsty, went down to a well, but, being carried along by the flow of water, was nearly drowned. A dove, however, seeing this, picked a twig from a tree and threw it into the well, and the ant, sitting upon it, made its escape. Later a bird catcher, armed with arrows, intended to secure the same dove. But when the ant saw this, she bit the foot of the bird hunter. Feeling the sudden pain, he dropped the arrows, and caused the dove to fly away at once. Moral: It is of importance to show gratitude to your benefactors.

As Æsop flourished (if he flourished at all) about 600 B. C., it will be seen that this remarkable tale is old indeed. It may with propriety be suggested that aspiring naturalists and especially those interested in zoölogy devote part of their earliest attention to this cheerful ancient mythologist, or at least to the collection of fables bearing his name. They will go far toward proving the truth of the old saying that "nothing is new under the sun." — S. M. GRONBERGER, *Washington, D. C.*

RECENT LITERATURE.

Ridgway's 'Color Standards and Color Nomenclature.'[1] — Twenty-seven years have elapsed since the publication of Mr. Ridgways' "Nomenclature of Colors for Naturalists." Although this work at once became the standard for almost all descriptive work involving color names, the author realized its imperfections and within two years set about gathering materials for the more comprehensive treatise which is now before us. Probably no one in this country is better qualified for the task than Mr. Ridgway as he combines the artist's knowledge and appreciation of color with a large experience in matching colors in nature and a keen perception of minute differences in color tones.

[1] Color Standards | and | Color Nomenclature | By | Robert Ridgway, M. S., C. M. Z. S., etc. | Curator of the Division of Birds, United States | National Museum. | With Fifty-three Colored Plates | and | Eleven Hundred and Fifteen Named Colors.| Washington, D. C. | 1912. | Published by the Author.| 8vo, pp. 1–43, pll. I–LIII. Price $8. (cash with order), postage extra, registered 20 cts.

As was to be expected the treatment in this work is thoroughly scientific. The spectrum is divided into 36 colors which run in oblong blocks across the middle of the first twelve plates, three shades to a plate. Immediately above these is another series of 36 colors each one differing from its respective spectrum color by a definite admixture of white. Above these are two more series each with a larger proportion of white while below the spectrum colors are three series of shades differing from the latter by successive admixtures of black. We have therefore six shades based upon each of the 36 spectrum colors ranging upward toward white and downwards toward black.

Beginning with plate 13 we have the whole series over again with a definite proportion of neutral gray added to each of the 216 shades, and on the following plates additional series with two, three, four and five proportions of neutral gray added. As the whole scheme gradually tends toward a uniform gray tint the number of shades that are distinguishable decreases as we advance so that the latter series do not contain as many blocks as the earlier ones.

Every one of the 1115 shades is named and Mr. Ridgway has searched the literature and even trade catalogues for color names already in use. While the shades represented seem to be about all that the average eye can distinguish, nevertheless the author finds that 36 of the named colors in this former 'Nomenclature' fall between some of those here depicted, consequently they are dropped and their true position indicated in a table. Unfortunately many well known names fall in this way, but ornithologists who have seen so many familiar generic and specific names sink into oblivion can probably part with such terms as 'buff,' 'canary yellow,' 'azure blue,' 'ochraceous,' 'vermilion,' 'violet,' etc. without serious inconvenience. Indeed the use of some of these names like that of the discarded technical terms has been so abused that it is better after all to avoid them.

A complete catalogue of color names with plate reference makes it easy to find any shade that may be referred to, while an understanding of the arrangement of the plates enables one to find all the 'reds' or 'blues' without delay for purposes of comparison.

The whole plan is discussed in detail in the 'Prologue' with reference to various works dealing with the subject.

In order to avoid the possibility of variation in the tints in the individual copies, each color, for the entire edition, was painted uniformly on large sheets of paper from a single mixture of pigments, these sheets being then cut into the small oblongs which represent the colors on the plates.

Mr. Ridgway's volume forms a color standard which is about as nearly perfect as it can probably be made. It is absolutely indispensable to the working naturalist not only as a guide to the nomenclature of his own descriptions, but as a key to the descriptions of others. That it will long remain the standard work of its kind goes without saying and both naturalists and artists should be deeply grateful to Mr. Ridgway for the years of labor that he has expended upon this work.— W. S.

Swann's 'A Dictionary of English and Folk-Names of British Birds.'[1] — Bird students cannot but speculate upon the origin of the various vernacular names which they encounter in the literature of ornithology and as few are students of philology or folk-lore Mr. Swann's handy volume comes as a welcome work of reference in which we may find the answer to many a question. He presents a list of upwards of 5000 names which have been applied to British birds, arranged alphabetically, with their meaning and origin where traceable, and accompanied by fables and verses, regarding the various species, which have been handed down in the folk-lore of England. As most of the American bird names are adapted from those of English species, the work appeals alike to ornithologists on both sides of the Atlantic.

The author finds the "Avium Praecipuarum Historia" of W. Turner 1544 to be the first work containing a list of birds with English names affixed, and beginning with this and the occasional bird names of Chaucer, he has traced the varying nomenclature through a long list of publications which are cited in the bibliography.

The longer articles contain much interesting reading. We find under 'Barnacle-Goose,' the ancient belief that these geese where hatched directly from barnicles which fell from a tree called the Goose-tree, but it is further pointed out that the name 'Bernicle' probably referred originally to the bird and that its application to the cirriped was secondary. 'Brant' we find is derived from the Welsh '*brenig*' a limpet, doubtless from some similar association. 'Cob' and 'Pen' we learn were old names for the male and female Swan, while 'Ruff' and 'Reeve' for the sexes of the Ruff, the question being still open as to whether the bird was named after the Elizabethan frill or the frill after the bird.

'Bittern' comes from *Botaurus* originally *boatum tauri*, the 'bellowing of a bull'; 'Cormorant' from *Corvus marinus*; 'Sea Crow,' and 'Lapwing' from the Anglo Saxon *Hleapewince*, 'one who turns in running or flying.'

Among the many interesting scraps of folk-lore we may mention the legend of the Crossbill having acquired its twisted beak from striving to draw the nails that held Christ to the Cross; also the verse regarding the Carrion Crow:

One 's unlucky,
Two 's lucky;
Three is health;
Four is wealth;
Five is sickness,
And six is death.

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[1] **A Dictionary | of | English and Folk-Names | of | British Birds, | With their History, Meaning and first usage: | and the Folk-lore, Weather-lore, Legends, etc., | relating to the more familiar species. | By | H. Kirke Swann. | Witherby & Co., | 326 High Holborn, London W. C. | 1913. 8vo, pp. i–vii, 1–266. 10 shillings net.**

and that referring to the Magpie

One is sorrow, two mirth,
Three a wedding, four a birth,
Five heaven, six hell,
Seven the de'il's ain sell.

Ancient Swan-worship is referred to and the survival to the present day of the ancient oath, in the form 'I swan' or 'I swanny.'

The only criticism that we would make of this valuable book is the need of fuller cross references. Under 'Swan' we find, "see mute-Swan" (p. 163) while as a matter of fact there is more information regarding Swans under Whooper Swan (p. 253) than under the reference cited, and such general terms as Sandpiper, Gull, Owl, etc. are not to be found at all, though under some one of the species doubtless the origin of the names is explained. — W. S.

Chapman's 'Color Key to North American Birds.'[1] — This is a new edition of Mr. Chapman's well known and useful volume. The main text is unchanged but the Systematic Table presents all the species and subspecies of North American Birds with their nomenclature revised to and including the last supplement to the American Ornithologists' Union's 'Check-List,' while an Appendix explains in detail the changes that have taken place since the first edition of the 'Color Key,' and presents descriptions of the forms that have been added to the list.

A second appendix consists of a 'Faunal Bibliography,' of publications dealing with the birds of various localities in North America arranged by states and provinces. This is very complete and is the most important list of the kind since that published by Dr. Elliot Coues as an appendix to his 'Birds of the Colorado Valley' in 1878. It will prove indispensable to those who are forming a collection of works on North American ornithology. With all its good features retained and the valuable additions to which we have alluded the 'Color Key' should continue to hold its deservedly popular place in American bird literature.— W. S.

Hornaday's 'Our Vanishing Wild Life.'[2] — So numerous are the publications treating of wild-life conservation and so similar are many of them, that the average reader is inclined to pass by any new contribution to the

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[1] Color Key to North American Birds. With Bibliographical Appendix. By Frank M. Chapman, Curator of Ornithology in the American Museum of Natural History. With Upward of 800 Drawings by Chester A. Reed, B. S. Revised Edition. New York. D. Appleton & Company. 1912. 8vo., pp. i–x, 1–356. Cloth, $2.50 net. Postpaid, $2.74.

[2] Our Vanishing Wild Life. Its Extermination and Preservation. By William T. Hornaday, Sc. D., Director of the New York Zoölogical Park; author of "The American Natural History"; Ex-President of the American Bison Society. With Maps and Illustrations, New York, New York Zoölogical Society, 1913. 8vo, pp. i–xvi, 1–411, net $1.50 (Chas. Scribner's Sons, N. Y. City).

subject, so that in a way it fails of its mission. It is gratifying therefore at a time when the support of the entire country is necessary, to the success of this movement to find a work such as Dr. Hornaday's which in originality of illustrations and method of presentation, *compels* the attention of everyone into whose hands it finds its way.

The first paragraphs of the preface sound the key note of the work: "Beyond question, we are exterminating our finest species of mammals, birds and fishes *according to law!* I am appalled by the mass of evidence proving that throughout the entire United States and Canada, in every state and province, the existing legal system for the preservation of wild life is fatally defective. There is not a single state in our country from which the killable game is not being rapidly and persistently shot to death, legally, or illegally, very much more rapidly than it is breeding, with extermination for the most of it close in sight. This statement is not open to argument; for millions of men know that it is literally true. We are living in a fool's paradise." In the 44 chapters into which the work is divided every phase of the subject is considered and the terse and forceful comments of the author follow the quotations on the title page "Hew to the line! Let the chips fall where they will"; "Nothing extenuate, nor set down aught in malice."

The book is a mine of information for the army of people who are enlisting in the effort to save our wild life from extermination and they can obtain here in concise form the facts and arguments that they require in carrying on the campaign.

There is a strong 'Foreword' by Dr. Henry Fairfield Osborn, President of the New York Zoölogical Society and a fitting dedication to Mr. William Dutcher, President of the National Association of Audubon Societies and "life-long champion of American birds."

All friends of wild life owe a debt of gratitude to Mr. Hornaday and to the New York Zoölogical Society for the preparation and publication of such a work.

The Zoölogical Society's Bulletin for May, 1913, contains reproductions of many of the illustrations of Mr. Hornaday's work, with a fine colored plate of birds threatened with extinction and strong articles on Wild-life conservation.— W. S.

Mathews' 'The Birds of Australia.'[1]—Three parts of Mr. Mathews' great work have appeared since our last issue. Part 5 of Volume 2 completes the account of the Pacific Gull and covers the Skuas, while the two parts of volume 3 deal with the Charadriiformes, treating of the *Morinellidæ* (Turnstones), *Hæmatopodidæ* (Oyster catchers), *Charadriidæ* (Plovers) *Recurvirostridæ* (Stilts and Avocets), and *Scolopacidæ* (Snipe etc.).

[1] The Birds of Australia. By Gregory M. Mathews, Vol. II., pt. 5, January 31 (pp. 477–527, pll. 121–124, Contents, Preface etc.); Vol. III., pt. 1, April 2 (pp. 1–104, pll. 125–137); pt. 2, May 2, (pp. 105–204, pll. 138–150). Witherby & Co., 326 High Holborn, London.

In discussing the Skuas, Mr. Mathews contends that the Pomerine Jaeger is much more closely allied to the true Skuas than to the other Jaegers, but as all three Jaegers differ from one another he proposes to place each in a genus of its own while he uses *Catharacta* Brünnich for the Skuas. *Stercorarius* is restricted to include only *S. parasiticus; Coprotheres* Reichenbach is used for *S. pomerinus* and *Atalolestris* gen. nov. is erected for *S. longicaudus. Catharacta lonnbergi clarkei* from the South Orkneys is described as new (p. 494), also *C. l. intercedens* from Kerguelen Isl. (p. 494) and *C. maccormicki wilsoni* from Weddell Sea (p. 495).

Mr. Mathew's rejection of Brisson's genera enables him to use *Catharacta* for the Skuas which would otherwise be untenable on account of the earlier *Catarractes*. We cannot agree with his attitude in the Brisson controversy. This is one of a number of mooted questions upon which the International Code may be differently interpreted and if we reject the vote of the Commission in these cases and insist on our personal views we might as logically do so in regard to the code itself. Uniformity is hopeless unless the vote of the Commission on such cases is accepted. Under the *Charadriiformes* we find a number of new generic names proposed viz.: *Afribex*, type *Vanellus lateralis* Smith (p. 41); *Rogibyx*, type *Xiphidiopterus cucullatus* (Temm.) (p. 41); *Pagoa*, type *Charadrius geoffroyi* Wagl. (p. 82); *Eupodella*, type *Charadrius veredus* (p. 83) *Pagolla*, type *Charadrius wilsonia* Ord. (p. 83) (*Octhodromus* being untenable on account of the prior *Octhedromus* Le Conte); *Afroxyechus*, type *Charadrius tricollaris* Vieill. (p. 124); *Elseya*, type *Charadrius melanops* Vieill. (p. 125); *Zarapita*, type *Numenius tenuirostris* Vieill. (p. 168); *Vetola*, type *Scolopax lapponica* L. (p. 191).

Also in spite of the fact that Mr. Mathews repeatedly states that he does not use subgenera we find three new names of this rank proposed on p. 114: *Pernettyva*, type *Charadrius falklandicus*; *Helenægialus*, Lath. type *Ægialitis sanctæhelenæ* Harting and *Paroxyechus*, type *Ægialitis placida* Gray and on p. 12 *Prohæmatopus*, type *Hæmatopus quoyi* Brab. & Chubb.

There is considerable discussion of exotic species under each generic heading and the history of generic subdivisions is given at length.

We find *Ægialitis mongolus* referred to a distinct genus *Cirrepidesmus* Bonap., while the Curlews are divided and *Numenius hudsonicus* and *N. borealis* are referred to *Phæopus*.

We note but one new subspecies *Hypsibates leucocephalus timorensis* E. Timor (p. 150).

Mr. Mathews' extreme views upon generic subdivision bring into use many names usually relegated to synonymy and these together with the new ones which he proposes will provide names for almost, if not quite all the groups of Charadriiformes that can possibly be differentiated Whether his nomenclature will be followed by others is open to question. His aim to be consistent in the amount of differentiation necessary for the recognition of a separate genus is praiseworthy, but consistency in judging questions of degree of difference involves the personal equation and can only be settled by the vote of a committee.

These parts of Mr. Mathews' work fully maintain the standard of their predecessors. We note with regret that while carefully designating type species for his new genera he still neglects to cite type specimens for his new species or subspecies.— W. S.

Official Check-List of the Birds of Australia.[1] — A Committee of the Royal Australasian Ornithologists' Union has been at work on a Check List of the birds of Australia for the past ten years. It is natural therefore that the result of their long deliberations which is at last before us should have been looked forward to with considerable interest. However it may appeal to Australian bird students, it must certainly be disappointing to progressive ornithologists in other parts of the world.

The Committee carries the principal of priority for genera, species and subspecies, no further back than the 'works' of John Gould 'entitled, "The Birds of Australia."' Gould's names however are superseded (*a*) "where they were preoccupied in some other branch of zoology, (*b*) where there had been a clear mis-identification of extra-limital and other forms, (*c*) where in the light of later knowledge genera had been rejected or new genera created, and (*d*) manifest errors." For admitted genera, species and subspecies described since the dates of the respective issues of Gould's works, and prior to the dates of the British Museum Catalogue of Birds, the names of the latter work are adopted subject to the above exceptions, while for admitted genera, etc., described later, the name used by the author has been "as far as possible accepted." Along with this we have a statement that a binomial nomenclature is used throughout, and that "all modifications of species ranging to and comprehending subspecies are brought into classification and named, but geographical races are not so, unless such modifications present some material distinguishable differences."

These principles we think constitute the most remarkable 'Code of Nomenclature' that has been framed in recent times.

The Committee would have accomplished its purpose and have freed itself from much adverse criticism if it had adopted the suggestion of Sir E. Ray Lankester, which is quoted on p. 13, and simply presented an 'authoritative list of names' without attempting to cite any rules or explanations.

As it is, the members seem to have failed utterly in comprehending the problem before them. They were surely aware of the fact that in ornithology as in every branch of zoology and botany we are confronted today

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[1] **Official Check-List of the Birds of Australia by Check-List Committee, Royal Australasian Ornithologists' Union. Adopted at Launceston, 19th November, 1912. Wth Report. Melbourne: Walker, May & Co., Printers, Mackillop Street. 1913. Supplement to "The Emu," Vol. XII, January, 1913. 8vo, pp. 1–116. Price to Non-Members, 5 shillings. Address Hon. Secretary R. A. O. U., Zool. Gardens, Melbourne.**

by a host of names for almost every species and genus, due largely to the carelessness and lack of opportunity of our predecessors. If we are provincial enough to shut ourselves off from the rest of the world and adopt a set of names that suits our fancy, well and good, but we cannot expect others to adopt our list, and if they follow our principle we shall have as many sets of names as there are countries and there will be no universal language of science.

There is no way to abolish the host of names already coined, and the clamor to preserve 'time-honored names' is ridiculous. Not only do we all differ as to what names are 'time-honored' but the loudest claimants for such action do not hesitate to subdivide old genera and so wipe out one half of each 'time-honored name,' as effectually as if done by the principle of priority. Therefore the International Zoological Congress established its Commission on Nomenclature which has prepared a code and which renders opinions upon questions that give rise to different personal interpretations. The only way to secure uniformity in nomenclature is to follow absolutely *both the Code and the Opinions* of the Commission. Any individual or committee that sets up a new point of departure for nomenclature or his own personal opinion in opposition to that of the Commission hinders by so much the realization of that end.

In the case of the present 'Check List' we fear that the progress of ornithology in Australia has been to some extent hindered although the progressive bird students of the country fortunately possess in Mr. Gregory M. Mathews' 'Reference List' an admirable check-list of Australian birds on advanced lines, following rigidly the International 'Code' and 'Opinions' except in the failure of the author to recognize Brisson's genera, a stand that we have always sincerely regretted. It is unfortunate that the Australian Committee could not have seen its way clear to avail itself of Mr. Mathews' laborious researches in nomenclature and so establish today as the official Australian nomenclature, what will inevitably sooner or later supersede that which is here presented.

In matters of the recognition of subspecies and subdivision of genera we cannot expect uniformity except by the majority vote of a committee, as the personal equation has here to be reckoned with and no code can settle the questions involved. Therefore we must expect differences in the number of forms included in the present list and that of Mr. Mathews. In its acceptance and rejection of forms however the Committee, apparently fails to comprehend the true nature of a subspecies. For instance it recognizes two subspecies of *Synorius* as occurring in Tasmania, whereas, if there are two recognizable forms it is the different environmental conditions of Tasmania and Australia which have differentiated the two forms. If both occur together then we have either two distinct species or a mere case of individual variation which requires no recognition in nomenclature. Just how 'subspecies' and 'geographic races' are differentiated, too, is not clear. Mr. Mathews regards the form just mentioned as a very questionable 'geographic race' yet the committee establishes it as a 'subspecies' with a binomial name!

The rules governing family and subfamily names are not given but we fail to see how the name *Peltohyatinæ* can be used when *Peltohyas* has been rejected in favor of *Eudromias* for the only species of the group, *E. australis*, which is the monotypic type of *Peltohyas!*

We regret exceedingly that we cannot endorse this Check-List for general use. Aside from all questions of nomenclature, it would serve a valuable purpose as a conservative list of Australian species and subspecies; but here it fails, in-as-much as the lack of synonymy makes it difficult or impossible to ascertain with which forms the many recently described races have been united.— W. S.

Riley on Birds of the Mount Robson Region.[1] — During July, August and September, Messrs. J. H. Riley and Ned Hollister of the U. S. National Museum joined the expedition of the Alpine Club of Canada to the Mt. Robson region of the Canadian Rockies, for the purpose of making a general survey of the fauna and flora. The general account of the expedition has been published in volume IV of the Club's Journal while this special number contains the scientific reports.

Mr. Hollister contributes an account of the mammals, and a list of the reptiles and batrachians, Mr. Riley reports on the birds and Mr. Paul C. Standley on the plants. The route included Jasper House, Henry House, then through the Yellow head Pass and up the Moose River to Moose Pass and Moose Pass branch of the Smoky River, with a stay on the Fraser River east of Moose Lake on the return.

Seventy-eight species of birds are listed including a Song and Fox Sparrow which Mr. Riley has described as new in a previous paper. Bohemian Waxwings were evidently breeding on the west fork of the Moose River, as a specimen obtained July 14 contained an egg nearly ready to be deposited. These birds were much paler than winter examples and similar individuals undoubtedly, as Mr. Riley suggests, formed the basis for Reichenow's subspecies *Bombycilla garrula pallidiceps* from Shesly River, B. C.

Mr. Riley found *Zonotrichia gambeli* and *Z. leucophrys* apparently nesting in the same spot while *Junco hyemalis hyemalis* and *J. oreganus shufeldti* were nesting together at Henry House, Yellowhead Pass and at the foot of Moose Pass, with no sign of intergradation. On the strength of this evidence he ranks them as distinct species. *Penthestes hudsonicus columbianus* is recognized as a distinct form and *Lagopus leucurus peninsularis* is considered as no more distinct from true *leucurus* than is *L. l. altipetens*, the two being respectively the northern and southern extremes of the White-tailed Ptarmigan. Mr. Riley contends with apparent justice that both or neither should be recognized.

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[1] **Birds Collected or Observed on the Expedition of the Alpine Club of Canada to Jasper Park, Yellowhead Pass, and Mount Robson Region. By J. H. Riley. Canadian Alpine Journal, Special Number. Alpine Club of Canada (Treas. S. H. Mitchell, Sidney, Vancouver Island, B. C.) 8vo, pp. 1–97 (Birds 47–75). Price $1.00.**

Interesting observations are given on the plumage of grouse and ptarmigan, and of the young of the Pipit.

The paper is a valuable contribution to the ornithology of an interesting region and will aid materially in ascertaining the exact range and relationship of the birds of the northern Rockies.— W. S.

Riley on New Neotropical Birds.— Through the courtesy of Mr. Chas. T. Ramsden, Mr. Riley was enabled to examine a series of the resident King Rail of Cuba which, as he had suspected,[1] proved to be separable and is consequently named, *Rallus elegans ramsdeni*.

Three Hummingbirds of the genus *Chlorostilbon* in the U. S. National Museum, obtained on the Purus River, Brazil, are found by Mr. Riley to be unlike any known species of the genus and are described[2] as *Chlorostilbon puruensis*.

Owing to the transfer of the name *Tanagra* from the Blue Tanagers to the Euphonias Mr. Riley considers that *Euphonia sclateri* Sundevall 1869, now *Tanagra sclateri*, renders *Tanagra sclateri* Berlepsch 1880 untenable for the Blue Tanager of Trinidad, and renames it *Thraupis episcopus nesophilus*.[3] We cannot however see the necessity for such action. The two species were described under different generic names and are still in different genera.— W. S.

Todd on the Genus Chæmepelia.[4]— We seldom find a more elaborate or painstaking monograph than that which Mr. Todd here presents on the Ground Doves. Incidentally it illustrates how apt we are, in our haste to propose new names and straighten out matters of nomenclature, to overlook the work of our predecessors along the same lines. This genus has been a storm center in such matters. Some years ago diverse opinions were held as to whether the Linnæan name *passerina* should apply to the Jamaican Ground Dove or to that of the southeastern United States, one receiving one new name and the other two, in consequence. Then came a controversy as to whether *Columbina* or *Chæmepelia* was the proper name for the genus. This was referred to a national and international committee with the result that it was declared still an open case to be settled by the first person to definitely designate a type. An immediate designation followed.

Mr. Todd however, by a little bibliographic research now shows us that

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[1] The King Rail of Cuba, By J. H. Riley, Proc. Biol. Soc. Wash., XXVI, pp. 83–86, March 22, 1913.

[2] A New Hummingbird of the Genus *Chlorostilbon* from Brazil. By J. H. Riley, do. pp. 63–64, March 22, 1913.

[3] A New Name for *Tanagra sclateri* Berlepsch. By J. H. Riley, do., XXV, pp. 185–188. December 24, 1912.

[4] A Revision of the Genus Chæmepelia. By W. E. Clyde Todd. Ann. Carnegie Mus. VIII, pp. 507–603, May 8, 1913.

all the discussions and publications bearing upon this subject were superfluous as G. R. Gray had settled the generic question definitely and conclusively as long ago as 1841, while Bonaparte in 1855, had settled the former problem with equal finality!

Mr. Todd's studies have been based upon a series of 1920 specimens representing all the known forms while his exhaustive synonymy has been personally verified with the exception of about fifty references and all but a half dozen of these have been checked up by correspondents. Full descriptions and measurements are presented for each form, with a discussion of distribution and nomenclature, while a full list of localities and specimens, and a key to the species and subspecies are added.

Sixteen races of *Chæmepelia passerina* are recognized, two of *minuta*, two of *rufipennis* while *buckleyi* and *talpacoti* remain undivided. The name *passerina* is used for the bird of the southeastern United States, as long ago restricted by Bonaparte; *pallescens* for that of the west, while *bahamensis* is used for the Bermuda form, which proves not separable from that of the Bahamas, from which islands it was probably introduced rather than from the mainland. The other races are *neglecta* from Panama to Guatemala; *soccorroënsis*, Socorro Island; *parvula* subsp. nov. from Honda, Colombia; *nana* subsp. nov., Jiminez W. Colombia; *quitensis* subsp. nov., Quito, Ecuador; *grisola*, Guiana and Amazonia; *albivitta*, N. Venezuela and Colombia and the Leeward Islands; *antillarum* Grenada to Barbados; *trochila*, Porto Rico to St. Lucia; *aflavida*, Cuba and Haiti; *insularis*, Grand Cayman, Little Cayman and Cayman Brac; *jamaicensis*, Jamaica; *exigua*, Mona and Great Magna.

C. minuta minuta ranges over most of S. America; while *C. m. elœodes* occurs from west central Colombia to southern Mexico. *C. rufipennis rufipennis* occurs from South America to Guatemala and *C. r. eluta* in the 'tierra caliente' of Mexico.

Mr. Todd's paper is a model piece of work and clears up the relationships of a group of birds which was badly in need of revision.— W. S.

Cory on New Neotropical Birds.[1]— Mr. Cory here presents some results of his studies of the birds obtained on the recent museum expeditions to Venezuela and Peru undertaken by Mr. W. H. Osgood, Mr. Ned Dearborn and others. The following forms are described without further comment: *Nothocercus julius venezuelensis*, Paramo de Tama, Ven.; *Eupsychortyx cristatus continentis*, El Panorama, Ven.; *Urochroma costaricensis*, Limon, C. R.; *Piaya cayana venezuelensis*, Orope, Ven.; *Momotus osgoodi*, El Guayabal, Col.; *Scytalopus magellanicus grandis*, Tambo Ventija, Peru; *Threnetes frazeri venezuelensis*, Orope, Ven.; *Anthracothorax prevosti viridicordatus*, El Panorama, Ven.; *Glaucis hirsuta fusca*, Orope, Ven.; *Thau-*

[1] Descriptions of Twenty-eight New Species and Subspecies of Neotropical Birds. By Charles B. Cory. Field Museum of Nat. Hist. Publication 167. Ornithological Series, Vol. I. No. 7. May 31, 1913. pp. 283–292.

mastura cora montana, Hda Llagueda, Peru; *Laticauda rubriginosa*, Balsas, Peru; *Galbula ruficauda brevirostris*, Encontrados, Ven.; *Chelidoptera tenebrosa pallida*, Empalado Savannas, Ven.; *Picumnis venezuelensis*, Encontrados, Ven.; *Phæthornis anthropilus fuscicapillus*, Orope, Ven.; *Camptostoma pusillum tenuirostris* Rio Aurare, Ven.; *Empidochanes zuliensis*, Orope, Ven.; *Inezia caudata intermedia*, Rio Aurare, Ven.; *Attila rufipectus confinis*, Orope, Ven.; *Thamnophilus doliatus dearborni*, Encontrados, Ven.; *Dendrocincla tyrannura hellmayri*, Paramo de Tama, Colombia; *Furnarius aguatus venezuelensis*, Rio Aurare, Ven.; *Margarornis perlata peruviana*, Tambo Ventija, Peru; *Microrhopias grisea fumosa*, Encontrados, Ven.; *Cœreba luteola obscura*, Encontrados, Ven.; *Diglossa sittoides intermedia*, Cajamarca, Peru; *Synallaxis candei venezuelensis*, Rio Aurare, Ven.; *Atlaptes castaneifrons tamae*, Paramo de Tama, Ven. It is unfortunate that in a paper of this kind the species are not arranged in some sort of order either systematic or geographic. Even though it consist of nothing but diagnoses orderly arrangement is an advantage. Ornithologists will await with interest the full report on these interesting collections.— W. S.

Cooke's Distribution and Migration of N. A. Herons.[1]— This bulletin follows the plan of other similar reports by Prof. Cooke and presents in concise form the breeding and winter range of each of the thirty-two species of Herons, Ibises etc., found from Panama and the West Indies northward. The migration dates are given for such species as are regularly migrant while maps present graphically the ranges of the various forms. Subspecies are mentioned in most instances as under *Ardea herodias* and *Butorides virescens* where the recent revisions of Oberholser are followed but *Egretta candidissima brewsteri* of Lower California is not recognized, although no reasons are given for such action.

The records quoted through the report are compiled largely from the printed records in ornithological literature and while numerous are by no means complete. In the case of the Great Blue Heron we notice winter records and breeding dates for Pennsylvania and New Jersey published in 'Cassinia' which as well as similar records for other species are omitted. The migration dates are computed solely from the records of the Biological Survey.

This report is a welcome addition to the series being issued by the Department of Agriculture.— W. S.

Trotter on Faunal Divisions in Relation to Vegetation.[2]— Dr. Trotter discusses in an interesting way the geographic distribution of

[1] Distribution and Migration of North American Herons and their Allies. By Wells W. Cooke. U. S. Dept. of Agriculture, Biological Survey — Bulletin No. 45. Issued May 24, 1913. 8vo, pp. 1–70, figs. 1–21.

[2] The Faunal Divisions of Eastern North America in Relation to Vegetation. Jour. Acad. Nat. Sci., Phil. XV, pp. 207–217. March 21, 1912.

animal life in eastern North America with regard to its general environment, and makes the claim that while "temperature unquestionably does exert an influence in the distribution of living beings, . . . it is not the supreme cause of the present phase of dispersal." There is much to be said on this subject and Dr. Trotter's views are well worthy of careful consideration. It is fortunately true that by whatever names we call them and whatever rank we give them the larger life areas remain practically the same in all recent discussions. At the same time however we must recognize that there are in Eastern North America certain lines of demarkation in plant life due to causes other than temperature, and the regions thus separated carry with them corresponding differences in their animal life. Furthermore the boundary lines are far more pronounced than those separating certain zones based on purely climatic conditions. Like many another problem there are probably several factors involved, and we must consider each of them, if we are finally to arrive at a proper understanding of conditions as we find them.— W. S.

Thayer and Bangs on Chinese Birds.[1]— This paper is a report upon a collection of '3135 beautifully prepared skins representing 358 species and subspecies obtained by Mr. W. R. Zappey in Central China. One new genus, five new species and seven new subspecies are described as follows: *Ithagenes wilsoni, Callocalia inopina pellos, Heteroxenicus cruralis formaster, Tesia grallator, Suthora unicolor canaster, Suthora zappeyi, Pnæpyga mutica, Oreocincla dauma socia, Reguloides maculipennis debilis, Prinia inornata exter, Sylviparus modestus occultus, Boanerges* (gen. nov. allied to *Perisoreus*), *internigrans*, all from western Szechwan. Eight additional new forms from this collection were described in a previous paper[2] and one in a later one.[3] Full lists of localities from which specimens are obtained and often brief notes on plumage and habitat are given in the present contribution while there are some comments of a nomenclatorial character. *Hypsipetes* is found to be preoccupied and *Microscelis* is used instead but no further details or references are presented; *Dumeticola* is recognized as distinct from *Tribura*; *Chloris* is used in preference to *Liguriuus*; *Propasser* is not deemed worthy of recognition. — W. S.

Bangs on Some Birds from the Highlands of Siberia.[4]— In this paper Mr. Bangs reports on a collection of 287 bird skins obtained by Messrs. N. Hollister and Conrad Kein who accompanied Dr. Theodore

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[1] Some Chinese Vertebrates. Memoirs Mus. Comp. Zool. Vol. XL, No. 4. Aves, By John E. Thayer and Outram Bangs, pp. 137–200. pll. 3–6. August, 1912.
[2] Bull. Mus. Comp. Zool. 1909, p. 139–141.
[3] Proc. Biol. Soc. Wash., XXVI, pp. 95–96. May 3, 1913.
[4] Some Birds from the Highlands of Siberia. By Outram Bangs, Bull. Mus. Comp. Zool., LIV., pp. 463–474. January, 1913.

Lyman on an expedition to the Altai Mountains of Siberia and Mongolia, and which was presented to the Museum of Comparative Zoölogy.

The list includes 52 species and subspecies of which the following are described as new: *Falco æsalon lymani, Pinicola enucleator pacata,* and *Perisoreus infaustus opicus.*— W. S.

Thayer and Bangs on a New Race of Great Blue Heron.[1]— The specimens upon which this form — *Ardea herodias sancti-lucae* — is based were obtained by Mr. W. W. Brown, Jr. in 1910 from a 'rookery' discovered on Espiritu Santo Island. It is very much like the bird of the Galapagos *A. b. cognata* but much larger. — W. S.

Bangs on New Species of Birds.— Mr. Outram Bangs has recently published descriptions of a number of new birds from various parts of the world. In one paper[2] are described *Rupornis magnirostris occidua,* eastern Peru; *Penelope perspicax,* western Colombia; *Antrostomus rufus otiosus,* St. Lucia, W. I.; *Thamnophilus doliatus catus,* Margarita Isl., Venezuela; *Pyrocephalus rubinus blatteus,* British Honduras; and *Leistes superciliaris petilus,* Uruguay. As regards the *Pyrocephalus* the reviewer pointed out the difference between the birds of Yucatan and Orizaba in collections made by him, in 1890 but the material in the U. S. National Museum seemed to show that the two forms were not confined to definite geographic areas and were perhaps merely individual variations.

In the collection of Palestine birds made by Selah Merrill and recently acquired by the Museum of Comparative Zoölogy, Mr. Bangs found an undescribed swift[3] which he calls *Apus melba petrensis*; while in the Henry Bryant Collection two Song Sparrows taken at Enterprise, Florida in 1859 seem to constitute a distinct resident race which is named *Melospiza melodia beata.*[4] They have "enormous bills, that cannot be matched in a series of over one hundred skins from points in eastern North America." The culmen measures respectively 14 and 13 mm. while Ridgway's average of 41 specimens of *M. m. melodia* is 12.45 mm. (11.43 to 13.21). From Cuba are described[5] *Podilymbus podiceps antillarum, Limnopardalis maculatus inoptatus, Cyanerpes cyaneus ramsdeni* and in the same paper

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[1] A New Race of Great Blue Heron from Espiritu Santo Island, Lower California. By John E. Thayer and Outram Bangs. Proc. N. Eng. Zool. Club, IV, pp. 83–84. February 23, 1912.

[2] Descriptions of New American Birds. By Outram Bangs, Proc. Biol. Soc. Wash. XXIV, pp. 187–190. June 23, 1911.

[3] A New Swift from Palestine, By Outram Bangs, Proc. Biol. Soc. Wash., XXIV, pp. 195–196. June 23, 1911.

[4] The Florida Song Sparrow. By Outram Bangs, Proc. N. Eng. Zool. Club, IV, pp. 85–87, June 5, 1912.

[5] New Birds from Cuba and the Isle of Pines, By Outram Bangs, Proc. N. Eng. Zool. Club, IV, pp. 89–92, March 31, 1913.

Gymnasio lawrencei exsul and *Agelaius subniger* from the Isle of Pines. *Reguloides pulcher vegetus* is described as new from western Szechwan, central China[1] while the Green Heron of the Maldives[2] is named *Butorides albidulus*.— W. S.

Zimmer's "Birds of the Thomas County Forest Reserve."[3] — The region covered by this paper comprises the U. S. Government Forest Reserve in Thomas County, Nebraska, to which Mr. Zimmer and other Nebraska ornithologists have given much attention. There is presented first an ecological classification of the several 'habitats', the sandhills being regarded as Upper Sonoran while the Prairie is Carolinian. The birds characteristic of each region are mentioned, followed by a fully annotated list of 142 species. While the nomenclature follows the A. O. U. List in the main we note that the possessive 's' of all personal names is dropped as is the trinomial from the 'typical' race except where another form of the same species occurs in the area under consideration, — the latter a rather inconsistent practice. This however in no way detracts from the value of the paper which is a well conceived and well presented contribution to the ornithology of an interesting region.— W. S.

California Economic Ornithology.— In Game Bulletin No. 1 (1913) of the California Fish and Game Commissioners, is reprinted Mr. H. C. Bryant's paper on "The present and future status of the California Valley Quial." The bulletin also contains Mr. Bryant's report on his "Investigation of the Economic Status of Non-Game Birds." This article describes the purposes and methods of the investigation, and briefly reports on the economic status of the Western Meadowlark, Blackbirds, and the Lewis's Woodpecker.

Mr. Bryant's final report on "The Economic Value of the Western Meadowlark in California" appears as Bulletin 236 of the State Agricultural Experiment Station. The percentages of animal and vegetable food for the year are reported as approximately 60 and 40. The writer concludes that the balance is certainly in favor of the Meadowlark.— W. L. M.

Four Economic Papers by Professor W. E. Collinge.— The Bullfinch (*Pyrrhula europæa*) has an evil reputation as a destroyer of buds of fruit trees, and Professor Collinge confirms this opinion by the results of examination of the stomachs of 308 of these birds. He finds that "during the five months, January to May, the food consists largely of fruit-buds

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[1] A New Warbler from Western China. By Outram Bangs, Proc. Biol. Soc. Wash. XXVI, pp. 95–96. May 3, 1913.

[2] The Green Heron of the Maldives. By Outram Bangs, Proc. Biol. Soc. Wash., XXVI, pp. 93–94, May 3, 1913.

[3] Birds of the Thomas County Forest Reserve. By John T. Zimmer. Proc. Nebraska Ornith. Union, Vol. V, Part 5. April 14, 1913. pp. 51–104.

and fruitlets, and in addition to those which are actually eaten, an equal, or even larger, number are wantonly destroyed by this bird. I have watched it for hours on plum trees destroying the buds wholesale, and similarly on currants."

"My year's record fully confirms the view I had previously held, largely founded upon observations in the field, that the bullfinch is for quite half the year most destructive in fruit orchards, causing considerable losses to growers, which far outweigh any little good it may do in keeping down the spread of weeds. Indeed, its value in this respect is extremely doubtful, for it certainly helps in the distribution of such weeds as the dandelion, dock, groundsel, ragwort, charlock, etc.[1]

A report on "The Food of nestling birds,"[2] gives the results of observations of parents feeding the young and of examination of stomachs of nestlings of the Starling, House Sparrow, Song Thrush and Blackbird. The writer's conclusions as to the nature of the diet and economic value of nestlings agree with those of Judd which he quotes.

The great need of study of the relations of British birds to agriculture is brought out in a paper entitled "The Economic Status of Birds."[3] The writer shows that a bird, which by the nature of its food is beneficial, may on becoming abundant come to be regarded as injurious. This case is illustrated by the California Linnet and the Starling. A brief summary of the economic value of British birds, by families concludes the paper.

Professor Collinge's discussion of "The Destruction and Dispersal of Weed Seeds by Wild Birds"[4] shows that he is in sympathy with the view expressed by Mason in "The Food of Birds in India" which was reviewed in 'the Auk' for July, 1912, pp. 413–416. He says: "We cannot rely on weeds being kept down by birds, and the expense of cultivation to eliminate weeds is, I believe, not reduced in the slightest by the action of birds."

Professor Collinge notes the investigations of Beal, Judd, Kerner, Ridley and Darwin, on the distribution of seeds by birds, and contributes the results of some of his own experiments. 133 weeds of 7 species were grown from 54 droppings of the House Sparrow, 52 plants of 7 species from 38 droppings of the Greenfinch and 96 plants of 9 species from 50 of the Bullfinch. He concludes that seed-eating birds act as distributors of weed seeds to a much larger extent than is generally supposed. Taking this in connection with the evidence regarding the destruction of weeds, Professor Collinge states that he cannot regard seed-eating birds as beneficial.—W. L. M.

Henderson's The Practical Value of Birds.[5] — This valuable little manual consists of tersely worded chapters on the Balance of Nature,

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[1] Journ. Economic Biol. Vol. VII, pt. 2, June, 1912, pp. 50–57.
[2] Journ. Bd. Agr. Vol. XIX, No. 6, Sept. 1912. Reprint 6 pp.
[3] Journ. Land Agent's Society, Oct., 1912. Reprint 5 pp.
[4] Journ. Bd. Agr. Vol. XX, No. 1, April, 1913. Reprint 12 pp.
[5] Univ. of Colo. Bulletin Vol. XIII, No. 4, April, 1913, 48 pp.

Rescue of crops, foliage and forests by birds, Quantities of food required by birds, Methods of investigation [of food habits], Necessity of bird protection and Systematic discussion. Under the last heading are given the main facts relating to the various orders and families, with more detailed notes on the most important species. All points made are supported by bibliographic references and the paper closes with a good bibliography. In fact Professor Henderson's publication is a concise and up-to-date compendium of information relating to economic ornithology and will be useful to all who are interested in the subject.— W. L. M.

Recent Educational Publications. —The Massachusetts Audubon Society has issued a third colored bird chart [1] for school and general educational purposes. It includes twenty species of winter birds from paintings by Louis Agassiz Fuertes and is even better than its predecessors. An explanatory pamphlet is by Winthrop Packard and furnishes such information as will be of assistance to teachers and scholars. The Meriden N. H. Bird Club has published a second annual report.[2] It is attractively printed and illustrated and presents numerous papers on how to attract birds, bird baths, bird enemies, bird boxes etc. The report does credit to the general manager of the Club, Mr. Ernest Harold Baynes.

From Alabama comes an admirable publication [3] prepared by Commissioner J. H. Wallace, Jr. of the Department of Game and Fish. It contains a great deal of important information on the value of birds together with poems on birds and nature, attractive illustrations and hints and programs for the conduct of 'bird day.'

California contributes two more numbers of the forceful publication entitled 'The Western Wild Life Call' [4] devoted respectively to the bill to prohibit the sale of wild game and that providing protection to the Dove, Band-tailed Pigeon, Shore-birds, Ducks, etc. The clear presentation of the need of action, by leading authorities, and the complete list of the state legislature with a call for every citizen to write to his representatives, form an admirable campaign document that could well be followed by other states in advocating similar legislation.— W. S.

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[1] Twenty Winter Birds. By Winthrop Packard to Accompany Audubon Bird Chart No. 3. Published for the Massachusetts Audubon Society, By Milton Bradley Company, Springfield, Mass. 1913. Chart and pamphlet $1.50.

[2] Second Report of The Meriden Bird Club, 1912. Boston, Mass. 8vo., pp. 1–82. With halftone illustrations and maps. One dollar, address Secretary of The Meriden Bird Club, Meriden, N. H.

[3] Alabama Bird Day Book, 1913. Issued by the Department of Game and Fish. John H. Wallace Jr. Commissioner, pp. 1–84 colored plates from 'Birds and Nature' and original halftones.

[4] Western Wild Life Call. Nos. 2 and 3. March 14 and 29, 1913. Published by the California Associated Societies for the Conservation of Wild Life.

The Ornithological Journals.

Bird-Lore.[1] Vol. XV. No. 2. March–April, 1913.

This number is devoted almost entirely to the Passenger Pigeon, with illustrations from photographs of live birds taken by J. G. Hubbard, in Dr. C. O. Whitman's aviary, in 1898.

A Vanished Race. By Moritz Fischer.

The Passenger Pigeon: Early Historical Records. By A. H. Wright.

Recollections of the Passenger Pigeon in Captivity. By Wallace Craig.

The Last Passenger Pigeon. By E. H. Forbush.

Migration of N. A. Sparrows. By W. W. Cooke — Fox Sparrow. Plumage notes by F. M. Chapman.

Two Educational Leaflets treat of The Emperor Goose, By E. W. Nelson, and The Crested Auklet, By C. H. Townsend.

Bird-Lore. Vol. XV. No. 3. May–June. 1913.

A Bird Apartment House. By Albert Morgan.— Sparrow Hawk, Bluebird and Flicker nesting in the same tree trunk.

A Purple Martin Colony. By W. M. Tyler. — At Salisbury, N. H.

Barn Swallows in Springtime. By J. W. Lippincott.— A good study of habits.

The Gray Kingbird at Home. By Henry Thurston.— At Tampa Bay, Fla.

A Pet Blue Jay. By Mrs. H. E. Merrill.

The Migration of N. A. Sparrows. By W. W. Cooke with Notes on the Plumage by W. DeW. Miller.— Treats of Pyrrhuloxia and Cardinal.

The Green Heron, by T. Gilbert Pearson and The Alaska Longspur By E. W. Nelson, are the Educational Leaflets of this number.

The Condor.[2] Vol. XV. No. 2. March — April, 1913.

Largely a prospectus of Dawson's proposed 'Birds of California.'

The Nesting of the Prairie Falcon in San Luis Obispo County. By W. L. Dawson.

William Leon Dawson — A Biography. By H. S. Swarth.

Allan Brooks — An Appreciation. By W. L. Dawson.

Leucosticte tephrocotis dawsoni.— A New Race of the Rosy Finch from the Sierra Nevada. By Joseph Grinnell.

Great Destruction of Birds' Eggs and Nestlings in the Sierra Nevada. By A. M. Ingersoll.

Birds Observed in the Summer of 1912 among the Santa Barbara Islands. By Howard Wright and G. K. Snyder.

The Wilson Bulletin.[3] Vol. XXV. No. 1. March, 1913.

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[1] Organ of the Audubon Societies. Edited by F. M. Chapman. Published by D. Appleton & Co. Harrisburg, Pa.

[2] Edited for the Cooper Ornithological Club, by Joseph Grinnell. Published at The Condor Office, Hollywood, California.

[3] Edited for the Wilson Ornithological Club, by Lynds Jones, Oberlin, Ohio.

Variations in Bird Migration from Year to Year. By W. W. Cooke — Prof. Cooke maintains "that the departure from the winter home has no connection with the weather, and that the *average* temperature at the *breeding grounds* is the principal factor that determines the time and speed of migration" and that "local variations in temperature should have only a slight influence in varying the dates of arrival from year to year." We think that in this he is probably correct but we cannot concede the degree of accuracy that he claims for various calculations based upon *individual first arrival* records. The causes of variation and inaccuracy in these are numerous and in any effort to 'correct' them the personal equation enters unconsciously. We believe, as elsewhere, stated that for accurate comparative studies the *combination* of a large number of records by different observers from one vicinity is an absolute necessity. Until such material is at hand much of the detailed calculation is futile.

Autumn Birds in Alcona County, Michigan. By J. Claire Wood. An interesting contribution to a little known section of the state. We trust that Mr. Wood will be able to add a supplementary report on the summer birds.

The Nest of the Goldfinch based on Study of the Deserted Nests. By Francis M. Root. Only two out of eleven showed any thistle down in the lining!

A Critique of Barrows' "Michigan Bird Life." By B. H. Swales.— Thirteen species are listed of which there seems to be no positive record of their occurrence in Michigan.

Notes on the Breeding Habits of Agelaius phœniceus. By W. L. Hackett.

Corrections to a Preliminary List of the Summer Birds of Fall River County, Southwestern South Dakota. By S. S. Visher.

The Oölogist.[1] Vol. XXX. No. 3. March 15, 1913.

The Nesting History of a Pair of Golden Eagles. By C. S. Sharpe. Excellent illustrations from photographs.

Nesting of the Prairie Horned Lark in Southern [i. e. south-western] Pennsylvania. By S. S. Dickey.

The Ibis.[2] X Series. Vol. I, No. 2. April, 1913.

The Birds of Hong Kong, Macoa, and the West River or Si Kiang in South-eastern China, with special reference to their Nidification and Seasonal Movements. Part II. By R. E. Vaughan and K. H. Jones.— This installment includes 79 species and is accompanied by a colored plate of eggs. Among many interesting notes we read that *Halcyon smyrnensis* and *H. pileatus* are much sought by the Chinese "who use their blue feathers for the manufacture of the well-known 'Kingfisher enamel,' which has been in use in China since the time of Confucius." *Palæornis torquata*

[1] Edited and published by R. M. Barnes, Lacon, Ill.

[2] Edited for the British Ornithologists' Union, by W. L. Sclater. Published by R. H. Porter, 7 Princes St., Cavendish Sq. W., London.

said to have been accidentally introduced is now well established at Hong Kong.

A Reference List of the Birds of New Zealand. Part I. By Gregory M. Mathews, and Tom Iredale — This is a thorough revision of New Zealand birds with the nomenclature brought into conformity with the International Code, and with the extreme generic subdivision which the authors favor. Numerous notes and explanations, and the more important synonyms are given under each species. We note as new forms: *Hydroprogne tschegrava oliveri*, *Sterna vittata bollonsi*, and *Sternula nereis davisæ*, while many other forms here recognized have been described by Mr. Mathews in recent numbers of his 'Birds of Australia' etc. The types of all the genera are definitely cited following the method of the third edition of the A. O. U. Check List. *Podiceps* we note is used for the Grebes on the claim that Gray's selection of *C. arcticus* Linn. as the type of *Colymbus* Linn. 1735 *nec* 1766 fixes the latter genus on the Loons. So far as we can see Mr. Mathews argument is sound and it is surprising that Gray's change of type in the 1855 edition of his 'List of Genera' should have been entirely overlooked.

Further Notes on the Birds of China. By J. D. D. La Touche.— Consists of additions to the list of Birds of Chinkiang and additional observations on the birds of Fohkien. Two specimens of the so-called *Junco siemsseni* Martens, previously known from the unique type, were obtained at Kuatun, north-west Fohkien, and the female is described for the first time.

Some Notes and Observations on a Guan (*Ortalis vetula*), suggested by an Examination of an Immature specimen. By Percy R. Lowe.— This is a very suggestive paper in which the theory is advanced that the Guans represent a type of gallinaceous bird in which the change from an arboreal to a terrestrial life has never been successfully completed. The young are shown to be remarkably well developed when hatched and are in most respects like young of terrestrial gallinaceæ, though certain characters indicate a comparatively recent arboreal life which the adults still follow. Mr. Lowe presents good arguments against the possibliity of this being a 'reversion' or return to the arboreal life.

On *Sterna hirundo* Linn. and on the Name of the Common Tern. By Einar Lönnberg — Decides that Linnæus referred to the Common Tern and not the Arctic as has been suggested.

Obituary notices of Dr. Edward A. Wilson who perished on Capt. Scott's Antarctic Expedition and Dr. Robert Collett. The former, by the way, was a great nephew of Dr. Thos. B. Wilson at one time president of the Academy of Natural Sciences of Philadelphia well known as a benefactor of that institution and an associate of John Cassin.

Under 'Letters etc.' there is a strong reply to Dr. Sclater's criticism of the new British Hand List by its authors.

Bulletin of the British Ornithologists' Club.[1] No. CLXXXV.

[1] Edited by W. R. Ogilvie Grant. Published by Witherby & Co., 326 High Holborn, London.

List of Melanistic, Albinistic and Hybrid birds exhibited by Hon. W. Rothschild.

The following new forms are described: *Turdus swynnertoni* Bannerman, Rhodesia; *Cypselus pacificus cooki* Harrington, Northern Shan States; *Acrocephalus taiti*, *Vini hendersoni* and *Porzana murrayi* described by Ogilvie-Grant from Henderson Island, South Pacific, with remarks on other birds of this little known island. Later, in No. CLXXXVII of the Bulletin it is pointed out that Mr. A. J. North had published a paper on Henderson Island birds in which two of these supposed new forms were named. *Vini hendersoni* = *V. stepheni* North and *Porzana murrayi* = *P. atra* North.

Bulletin of the British Ornithologists' Club. No. CLXXXVI.

New forms described: *Ptilotis ornata wesleydalei* Mathews, southwest Australia; *P. o. underbooli* Mathews Victoria; *Larus fuscus antelius* Iredale, Obi River.

Bulletin of the British Ornithologists' Club. No. CLXXXVII.

New forms: *Emberiza yessoënsis continentalis* Witherby, near Nanking, China; *Sitta europaea hispaniensis* Witherby, Spain and Portugal.

British Birds.[1] Vol. VI. No. 10. March 1, 1913.

Edward Adrian Wilson. An Appreciation. By W. S. Bruce.

Professor Robert Collett. By A. H. Cocks.

Increase and Decrease in Summer Residents 1912.—Compilation of Reports.

British Birds. Vol. VI. No. 11. April 1, 1913.

Henry John Pearson. A Memoir. By H. W. Feilden.

Notes on Mortality in Nestling Cuckoos. By J. H. Owen—Of 34 young Cuckoos observed in the nest during 1911 and 1912, seventeen came to an untimely end. The ratio, 50 percent, was exactly the same in each year.

Note on the Ejection of the Lining Membrane of the Gizzard by the Curlew. By H. Hammond Smith.—Other birds which possess the same habit are mentioned.

Are Starlings Double or Single Brooded? By N. F. Ticehurst—Some at least were proved to have two broods, by banding and recapture.

British Birds. Vol. VI. No. 12. May 1, 1913.

Early "Drumming" of the Snipe and its Significance. By H. Lynes.—Considers it due to earlier revival of sexual instincts on account of mild winter.

The Lesser Black-backed Gull of the British Isles. By Tom Iredale—An examination of the type of *Larus affinis* Reinhardt shows that it is the same as the recently described *L. fuscus britannicus* Lowe (cf. Bull B. O. C. CLXXXVI.)

"British Diving Ducks." A review of J. G. Millais' recent work by

[1] Edited by H. F. Witherby. Published by Witherby & Co., 326 High Holborn, London.

H. F. Witherby — The reviewer strongly refutes the author's claim of color change in feathers, citing Dr. Strong's papers with which Mr. Millais seems to have been unacquainted. Other points are also discussed at length and the review is really one of the leading papers in the number.

The Avicultural Magazine.[1] Vol. IV. No. 5. March, 1913.

The Sexes of *Liothrix lutea* with Remarks on Modifications of the Species. By. A. G. Butler — colored plate.

The Tameness of Wild Geese. By I. Dorrien-Smith — On the Scilly Isles.

My Antarctic Goose, *Cloëphaga antarctica*. By F. E. Blaauw.

The Hooded Parrakeet, *Psephotus dissimilis* (Collett). By G. M. Mathews. — A history of its nomenclature. *P. cucullatus* North and *P. chrysopterygius blaauwi* Van Oort are both synonyms (see also Bull. Brit. Orn. Club, CLXXXV).

The Avicultural Magazine. Vol. IV. No. 6. April, 1913.

The Gardener Bower Bird. *Amblyornis inornata*. By H. D. Astley.

In Praise of Owls. By Miss E. F. Chawner — As aviary birds.

The Avicultural Magazine. Vol. IV. No. 7. May, 1913.

The Blue Niltava. *Xanthopygia cyanomelæna*. By H. D. Astley — Colored plate.

On Birds and their Surroundings between Puerto Varas and Puerto Montt. By F. E. Blaauw — Interesting account of a trip to Chile, illustrated.

The Pied Chat *Saxicola leucomelæna*. By H. D. Astley.— Plate in black and white.

The Endurance of Young Wild Ducks. By I. Dorrien-Smith — Notes on birds on the Scilly Isles.

Notes on the Mild Winter and the Birds. By P. F. M. Galloway — Vegetation in England practically five weeks in advance and birds in song and nesting much earlier than usual.

Bird Notes.[2] Vol. IV. No. 3. March, 1913.

Birds of the Sal Forest. By D. Dewar.— Pilibhit district of India.

Fairy Blue Birds. By W. T. Page.— Review of species and distribution.

Birds of Gambia. By E. Hopkinson (continued).

The Emu.[3] Vol. XII. No. 4. April, 1913.

On the Comparative Osteology of Cereopsis novæ-hollandiæ. By R. W. Shufeldt.— A vast amount of detail is presented but the results of the author's studies are exactly those given in the classification of Evans

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[1] Edited for the Avicultural Society, by Hubert D. Astley. Published by West, Newman & Co., 54 Hatton Garden, E. C., London.

[2] Journal of the Foreign Bird Club. Edited by Wesley T. Page, Treasurer. Sydney Williams, Holland Lodge, Edmonton, London, N. England.

[3] Organ of the Royal Australasian Ornithologists' Union. Edited by A. J. Campbell and Charles Barrett, Melbourne Australia. London Agents, Witherby and Co., 326 High Holborn.

&c. except that he separates the Tree-ducks in a separate subfamily, the reasons for which are to be presented in another paper.

Ornithological Notes, Barclay Expedition. By G. F. Hill.— A valuable annotated list.

Field Ornithology in South Australia. By S. A. White.

Report on Mutton-Bird Rookeries, Cape Wollomai. By A. J. and A. G. Campbell.— 884 occupied and 1416 unoccupied burrows.

Notes on a Small Collection of Bird Skins from the Northern Territory. By A. J. Campbell and J. A. Kershaw.

The Austral Avian Record.[1] Vol. I. No. 8. March 20, 1913.

New Subspecies of Birds from the Monte Bello Islands, N. West Australia. By P. D. Montague. *Eremiornis carteri assimilis* and *Anthus australis montebelli*.

Additional Species Described by Gould from Norfolk, Lord Howe and Philip Islands. By Witmer Stone and Gregory M. Mathews.

The Genus-Name Meliphaga. By G. M. Mathews.— Replaces *Ptilotis* Sw.

Additions and Corrections to my Reference List. By G. M. Mathews. — Twenty-six new forms, with type specimens designated.

New Genera. By G. M. Mathews.— Ten new.

Journal of the South African Ornithologists' Union.[2] Vol. VIII, No. 2. December, 1912.

Random Notes on South African Ornithology. By C. G. Davies.— Important note on habits of the Finfoot (*Podica petersi*).

The South African Lanner Falcon (*Falco biarmicus*) and its Congeners. By B. C. R. Langford.

The Wild Birds of the Pretoria Zoological Gardens. By Alwin Haagner.

The Value of Birds to Man. By James Buckland.

Ardea. (In Dutch.) Vol. II. No. 1. March, 1913.

On the Arrival of Certain Migrant Birds in Holland in 1912. By H. Ekama.

Ornithological and Oological Miscellany. By A. A. Van Pelt Lechner.

Results of Bird Banding at the Leiden Museum. By E. D. Van Oort.

Swan and Geese at Gooilust, Graveland. By F. E. Blaauw.

Ornithological Observations in Holland. By E. D. Van Oort.

Revue Francaise d'Ornithologie.[3] (In French.) Year V, No. 47. March, 1913.

Birds Collected in South-west Morocco, on the Madam Du Gast Expedition. By A. Menegaux.

Observations on Quail Banded and Released at Fayet on 1912. By F. Hugues.

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[1] Edited by Gregory M. Mathews. Published by Witherby & Co.

[2] Editors, Dr. J. W. B. Gunning, B. C. R. Langford and A. K. Haagner, Pretoria, Transvaal. London Agents, Witherby & Co., 326 High Holborn.

[3] Edited by A. Menegaux, 55, Rue de Buffon, Paris.

Revue Francaise d'Ornithologie. Year V. No. 48.

Descriptions of two New Birds of Paradise. By A. Menegaux.— *Paradisæa duivenbodei*, Yaour, Geelvink Bay, New Guinea; *P. raggiana sororia*, New Guinea.

Revue Francaise d'Ornithologie. Year V. No. 49.

On the Classification of Birds. By A. Dubois.

On *Houbara undulata* (Bp.). By A. Vaucher, with plate.

Abnormal Eggs. By A. Legros.

Journal für Ornithologie.[1] (In German.) April, 1913.

The Klein Bird Drawings (*continued*). By J. Gengler.

The Significance of Egg-Shell Structure for the Systematist. By A. Szielask.

Revision of the Genus *Cercomela*. By O. Neumann and O. Graf Zedlitz — *C. melanura erlangeri* subsp. nov., Khareba, S. Arabia; *C. scotocerca enigma* subsp. nov., Dire Dana, N. Somaliland.

How has the Appearance of the Landscape of West Prussia been Affected by the Operations of Man and How have the Habits of Birds been Influenced thereby? By F. Braun.

On the Banding of Rough-leg Hawks in Swedish Lapland in the summer of 1911. By L. A. Jägerskiold.

Studies of Bird Song. By C. Schmitt and H. Stadler — Extensive Use of musical notation.

Ornithologische Monatsberichte.[2] (In German.) March, 1913.

A few Remarks on the Ostrich Egg-shell Fragments from the Algerian Sahara. By H. Schalow.

Supplement to a Notice of Wild Ring Doves in Eutin. By R. Biedermann-Imhoof.

Rossitten Migration Notes. By J. Thienemann.— Also in the May number.

Titmice as Resident Birds. By H. Grote.

An Important Bibliographic Discovery. By F. Lindner.— A nearly complete copy of the first edition of Naumen's Ornithological Works.

Ornithologische Monatsberichte. April, 1913.

New Forms of Francolin from Persia. By N. Sarudny and M. Härms.— *Francolinus (Ortygornis) pondicerianus mecranensis* Valley of Rud-i-Sarbas River, Persian Beluchistan; *Francolinus orientalis arabistanicus*.

New African Birds. By O. Graf Zedlitz — *Eurocephalus anguitimens erlangeri*, Abyssinia; *E. a. deckeni*, S. Somaliland; *E. a. fischeri*, Udjiri-Sümpfe; *E. a. böhmi*, Langenburg; *Indicator exilis erlangeri*, Afgoi; *Francolinus sephæna jubaensis*, Afgoi; *Turtur decipiens elegans*, Afgoi; *Turtur capicola hilgerti*, Aurowin.

Totanus ochropus a winter visitant in Thuringia. By R. Fenk.

An Ornithological Rescript of the year 1751. By H. Schalow.

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[1] Edited by Dr. A. Reichenow. L. A. Kittler, Leipzig, Agent.

[2] Edited by Dr. A. Reichenow. R. Friedländer & Sohn, Berlin, N. W. 6, Karlstr. 11. Agents.

Ornithologische Monatsberichte. May, 1913.

Some Observations on the Frohburg-Eschefeld Pond in the early part of 1912. By R. Zimmermann.

Does *Poecile atricapillus borealis* really winter in Finnland. By H. Baron Loudon.

On *Francolinus granti* and *kirki*. By H. Grote.

On the Swimming of the Water Ouzel. By Tschusi zu Schmidhoffen.

On the Cessation of Song in Birds During a Solar Eclipse. By R. Biedermann-Imhoof.

Ornithologische Monatschrift.[1] (In German.) Vol. XXXVIII. No. 1. January, 1913.

Reports on Birds Breeding on the Memmert Bird Colony in 1912 by O. Leege; on the Colonies at Jordsand, Ellenbogen, Norderoog, Langenwerder and Poel by F. Dietrich; and on the Werder Islands by P. Gottschalk.— These are well illustrated and interesting to all workers for the conservation of wild bird life.

Observations on the Long-tailed Titmice during the Early Part of 1911 in Leboch Park. By K. Loos.

Notice and Bibliography of Prof. W. Blasius. By E. Blasius.

Ornithologische Monatsschrift. Vol. XXXVIII. No. 2. February, 1913. Annual Report of the Society for the Protection of Birds.

Ornithologische Monatsschrift. Vol. XXXVIII. No. 3. March, 1913. Articles on Manual training in schools in connection with bird protection — building bird boxes etc.

General Bird Observation in Ireland and England in July, 1911 (continued in April number).

Ornithologische Monatsschrift. Vol. XXXVIII. No. 4. April, 1913. Arrival and Departure Dates at Hallein [Austria] in 1912. By Tschusi zu Schmedhoffen.

On *Pratincola rubicola*. By K. Regel. Illustrated.

Proceedings of the Bavarian Ornithological Society.[2] (In German.) Vol. XI, No. 3. April, 1913.

The German "Gerlitz" and its Relationship to the Geographic Forms of the Genus Serinus. By A. Laubmann.— *Serinus canarius germanicus* subsp. nov.

A contribution to the Ornithology of the Bavarian Forest. By J. Gengler.

The Migration of Siberian Nutcrackers into Bavaria in 1911. By A. Laubmann.

On the Imitating of Middle European Birds. By H. S. and C. Schmitt.

The Appearance of the Nightingale (*Luscinia megarhynchos megarhynchos*) in the Palatinate. By K. Bertram.

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[1] Organ of the German Society for Protection of Birds. Edited by Dr. C. R. Hennicke and Dr. O. Taschenberg. Agent, Max Kretschmann Creutzschen Verlagsbuchhandlung in Magdeburg, Germany.

[2] Edited by C. E. Hellmayr, Munich. Gustav Fischer, Jena, Agent.

On a New Tanager from Trinidad. By C. E. Hellmayr and Josef Graf von Seilern.— *Sporathraupis cyanocephala büsingi*, Mount Aripo, Trinidad.

Ornithologisches Jahrbuch.[1] (In German.) Vol. XXIV. Nos. 1–2. January–April, 1913.

Breeding Birds of the Vicinity of Gmunden and Lambach [Austria]. By A. Watzinger.

Journal Notes on the Oder Delta country and Lower Pomerania. By R. J. Fromhelz.

A Contribution to the Ornithology of the Arber Country [Germany].

On the Appearance of Rock Sparrows (*Petronia*) in Würthemberg. By W. Bacmeister.

Messager Ornithologique.[2] (In Russian.) Vol. IV. No. 1. 1913.

Preliminary List of the Birds of the Tarsk District, Tobolsk, [Russia]. By W. E. Uschakow.

On Some Birds of the Kjelzer Government [Russia]. By E. I. Katin.

Acrocephalus streperus intermedius subsp. nov. By W. W. Stantschinski.

Corvus macrorhynchus mandshuricus subsp. nov. By S. A. Buturlin.

A New Geographic Form of Sparrow, *Passer montanus volgensis*. By S. I. Ognew.

New Forms of *Remiza*. By N. A. Sarudny — *Remiza pendulina bostanjogli*, *R. p. menzbieri*.

Names of the *Parus cinereus* Group. By S. A. Buturlin.— Recognizes four races besides the typical one; *bokharensis* Licht., *turcestanicus* Sarud. and Loud., *ferghanensis* Brit., and *dzungaricus* Sarud. and Bilkew.

An Ornithological Excursion to Sarsoan-nor and Marka-Kul Lakes, W. Siberia in 1909 (continued in this and the next number). By G. I. Poljakow.

Messager Ornithologique. Vol. IV. No. 2. 1913.

On the Ornithology of the North-eastern Sayan Mountains. By A. J. Tugarinow.

On Various Hybrids between the Yellow-hammer and White-headed Finch. (*Emberiza citrinella erythrogenys* and *E. leucocephalos*). By N. A. Sarudny.

The Chinese Swan (*Cygnus davidi* Swinh.) in Siberia. By W. Dorogostaisky.

The Question of the Systematic Position of the White-winged Magpie (*Pica leucoptera*). By S. I. Ognew.

Notes on the Distribution of Penthestes (= Poecile). By S. A. Buturlin.

Cyanistes cyanus yenisseensis But. et Tugar. in Kiev. By S. A. Buturlin.

A New Form of Dove (*Columba œnas hyrcana* subsp. nov.). By N. A. Sarudny and S. I. Bilkewitsch.

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[1] Edited by Victor Ritter von Tschusi zu Schmidhoffen Hallein, Salzburg, Austria.

[2] Edited by G. I. Poljakow, Gut. "Sawino," Oberalowka, Moscow Govt., Russia.

Aquila.[1] (In Hungarian and German.) XIX Volume. 1912.

A Sketch of the Status of 'Ornithophainology.' By Otto Herman — A review of recent works on bird migration.

The White Stork in South Africa. By Alwin Haagner and others.

Numerous papers on bird migration in Hungary.

The Vegetable and Insect Food of *Perdix perdix*. By L. Thaisz and E. Csiki.

Microscopic Anatomy of the Lower Intestine of Birds. By E. Greschik — Numerous species examined and full bibliography.

Fossil Birds of Hungary. By K. Lambrecht.

Bird Banding by the Hungarian Ornithologists' Union in 1912. By J. Schenk.

Bird Protection in Hungary, 1912. A number of Reports.

Rivista Italiana di Ornitologia.[2] (In Italian). Vol. II. No. 2. October–December, 1912.

Hybridism in the Production of a Systematic Species. By Alex. Ghigi.— Deals with Pheasants.

Singular Capture of an Eastern Species of *Ardetta* [in Italy]. By T. Salvadori — *A. eurythma* Swinh. new to Italy and to Europe.

Sula bassana on the Island of Elba and its Distribution in Italy. By G. Damiani.

Catalogue of a Small Collection of Birds from the Colony of Eretrea [N. E. Africa]. By F. Cavazza.

The Jay of Sardinia. By T. Salvadori and E. Festa.

Ornithological Articles in Other Journals.[3]

Rintoul, Leonora J., and **Baxter, Evelyn, V.** Bird Notes from the Isle of May. Spring and Autumn, 1912. (The Scottish Naturalist, March, 1913.)

Clarke, Wm. Eagle. The Song-Thrush of the Outer Hebrides — *Turdus musicus hebridensis* — A New Racial Form. (The Scottish Naturalist. March, 1913.) — Types from Island of Barra.

Andersion, Peter, The Birds of the Island of Tiree. (The Scottish Naturalist, April, 1913.)

Thomson, A. L. Aberdeen University Bird-Migration Inquiry: First Interim Report (1909–12) (The Scottish Naturalist, April, 1913.)

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[1] Edited by Otto Herman for the Royal Hungarian Central Bureau for Ornithology; Budapest, Hungary.

[2] Edited by Ettore Arrigoni Degli Oddi. Published by Stabelimento, Poligrafico Emiliano, Piazza Calderini, 6, Bologna, Italy.

[3] These titles represent papers which have not been sent to 'The Auk' for review but have been received in the library of the Academy of Natural Sciences. The editor is indebted to Mr. J. A. G. Rehn for keeping a memorandum of the titles from month to month and to Dr. Edward J. Nolan, librarian of the Academy for the privilege of examining them. Full reviews are given only when the papers are sent to 'The Auk'.— W. S.

Ramsay, L. N. G. On the Moulting of the Herring Gull (*Larus argentatus* and Other Species (The Scottish Naturalist, May, 1913).— In the bibliography or moult we notice the omission of a number of papers notably Dr. Dwight's 'Sequence of Plumage and Moults of the Passerine Birds of New York' (Ann. N. Y. Acad. Sci., 1900) — probably the most extensive contribution to the subject of moult that has yet appeared.

Selous, E. A Diary of Ornithological Observation Made in Iceland during June and July, 1912. (The Zoölogist, March 15, 1913) (continued in the April number).

Ingram, Collingwood. Description of a New Form of Long-tailed Tit. (*Ægithalus caudatus taiti*, Coimbra, Portugal (The Zoölogist, April 15, 1913).

Stubbs, F. J. Asiatic [and other] Birds in Leadenhall Market (The Zoölogist, April 15, 1913) — An interesting commentary on the cold storage trade.

Gurney, J. H. Ornithological Report for Norfolk (1912) (The Zoölogist, May 15, 1913).

Patten, C. J. The Diurnal Migration of Certain Birds Observed at the Tuskar Rock [Ireland] (The Zoölogist, May 15, 1913.) — A valuable contribution to the study of migration at lighthouses.

North, A. J. On the Early History of the Australian Cassowary (*Casuarius australis* Wall.). (Records of the Australian Museum, Vol. X, No. 4. April, 1913) — An interesting historical compilation.

Foyer, J. C. F. [*Artamus fuscus* feeding on butterflies in Ceylon preferring 'distasteful' species] (Abst. Proc. Zool. Soc. London, No. 121. May 6, 1913).

Bragg, L. M. American Scoter and Ring-necked Duck [in S. Carolina] (Bull. Charleston Museum, February, 1913.)

Bryant, C. A. The Passenger Pigeon (Forest and Stream, April 19, 1913).— Personal Recollection of the bird in Michigan.

Crandall, L. S. Wild Duck Farming a New Industry. (Out-door World and Recreation, April, 1913) — Excellent illustrations.

Shaw, W. T. A Bird that Butcher's (Out-door World and Recreation, June, 1913) — Photographs of a Shrike and its impaled prey.

Loring, J. A. Making Friends with Nature (Out-door World and Recreation, May, 1913) Intimate photographs of Chickadees, etc.

Timpel, Max. The Birds of Erfurt and Vicinity. (Jahrb. Königl. Akad. Gemeinnütziger Wissench. zu Erfurt. XXXVIII, 1912, pp. 1–98.) — List of 210 species with full discussion of nesting, migration, economic value etc.

Sassi, M. A New Species of the Genus *Cercococcyx*. *C. olivinus* nov. sp. (Ann. K. K. Naturhist Hofmus. Wien. 1912. XXVI, pp. 341–342.) — From the Rutschuru Valley.

Sassi, M. A Contribution to the Ornithology of Central Africa (Ann. K. K. Naturhist Hofmus. Wien, 1912, XXVI, pp. 347–393). Report on the birds collected on R. Grauer's expedition, December, 1909–February,

1911, through central Africa, Lakes Tanganika, Kivu, Albert Edward and into the Congo forest.

This installment covers all the groups but the Passeres and 193 species are listed. *Columba albinucha* from Moëra, and *Asio abessinicus graueri* from west of Lake Tanganika are described as new and the former figured.

O'Donoghue, Chas. H. A Table for Use in the Identification of Birds' Skulls. (Zool. Anzeiger XLI, pp. 465–468. 1913.) — 'Identification' carried only to palate-structure 'desmognathous' etc.

Blaauw, F. E. Across South America to Tierra del Fuego and back through the Smith-Channel (Notes from the Leyden Museum, XXXV, No. 1, December, 1912.) — Interesting comment in birds, and plate of young *Coscoroba*.

Van Oort, E. D. Report on Birds from the Netherlands. Received from September, 1911 till September 1, 1912. (Notes from the Leyden Museum XXXIV, No. 3–4, pp. 231–234).

Van Oort, E. D. Bird-Marking in the Netherlands. Recovery of Marked Birds (Notes from the Leyden Museum XXXIV, No. 3–4, November, 1912, pp. 243–256.

Roberts, Austin. The Grass Warblers of South Africa (*Cisticola, Hemipteryx.*) (Ann. Transvaal Mus., III, Part 4, pp. 227–266.) — *Cisticola aberrans minor* subsp. nov. Port St. Johns dist.; *C. monticola* sp. nov. Pretoria; *Hemipteryx major*, sp. nov. Grahamstown; *H. egregia* sp. nov Wakkerstroom.

Hartert, E. Expedition to the Central Western Sahara: Birds (Novitat. Zool. XX., No. 1, February, 1913. pp. 37–76.) Annotated list of species or subspecies, *Œnanthe leucopyga ægra* subsp. nov. Gara Khina. Also an interesting chapter on migration in which the author rejects the theory of narrow paths crossing the Mediterranean at definite points and also the guidance of birds by landmarks.

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CORRESPONDENCE.

Naturalists and 'Concealing Coloration.'

EDITOR OF 'THE AUK':

Dear Sir: — I hereby send you my periodical warning to naturalists that their supposed opposition to my so called ideas is in reality nothing but a state of error kept alive solely by ignorance. Any of the scores of intellectual persons who have spent even two days with me here, laugh to learn of the average naturalist's attitude about it and many of them are astonished to hear that no natural history institution has yet sent any committee to investigate this immense and revolutionary discovery. It is absolutely impossible for any one to see what I am showing and continue to doubt its significance. The discovery that thousands of species in all orders are each, no matter how they happen to look elsewhere, superhumanly perfect pictures of the very background against which it would apparently most help them not to show! Do naturalists really fancy that when a professional copier of nature, a picture-maker, tells them that these are such copies, the phenomenon is not worth investigating? Moreover it is not an individual artist that tells them this, but a representative body of them, composed of all the painters to whom I have shown the things. Many naturalists, feeling forced to believe that I am right about these wonderful copies, have said they admitted it but *disagreed about the deduction*. Here their position becomes hopeless; because, if they will not come and witness, they must take my word that the cases are practically the whole animal kingdom, all but the species that neither hunt nor are hunted; and if this is so, it is utterly absurd to try to call it accident.

ABBOTT H. THAYER.

Monadnock, N. H.,
June 12, 1913.

NOTES AND NEWS.

HERBERT BROWN, who was elected an associate member of the American Ornithologists' Union in 1885 and a member in 1901, died at Tucson, Arizona, May 12, 1913. At the time of his death Mr. Brown was 65 years old, having been born in Winchester, Virginia, March 6, 1848. He was twice married and leaves a widow and one son.

In 1873 he located in Tucson where he made his home throughout most of the remaining part of his life. In 1883 the writer lived a few months in Tucson and soon after his arrival became acquainted with Mr. Brown and found in him a most interesting companion and a congenial friend. As soon as he learned that I was an ornithologist he expressed the greatest pleasure saying that for years he had been keenly interested in birds but did not know how to identify them nor how to make skins. He soon learned to prepare excellent specimens and since that time continued his ornithological studies with much enthusiasm whenever possible. Ultimately he came to know Arizona birds very well. He was curator of the museum of the University of Arizona from its foundation, and his collections in various branches of natural history were donated to this institution. He always took an active interest in scientific work and cordially welcomed scientific workers who visited Tucson. As a consequence he made many warm friends among scientific as well as non-scientific men who will feel his death as a personal loss.

For some years after his arrival in Tucson he had many adventurous experiences especially during prospecting trips in the desert mountains of Arizona and northern Sonora. During this time he had several narrow escapes from Apache Indians and from death by thirst on the waterless desert plains of that region.

Soon after we became friends he told me about a kind of "Bob-white" quail he had often seen on the grassy plains south of Tucson, near the Sonora border, and my interest in the subject led him to secure and send to Mr. Ridgway the first specimen ever collected of the bird afterwards described as *Colinus ridgwayi*.

For many years Mr. Brown was connected with newspapers in Tucson as reporter, editor or owner, and was one of the best known and most highly respected members of the community. At the time of his death he was President of the Audubon Society of Arizona, and Clerk of the Superior Court of Pima County.—E. W. N.

THE study of bird songs is a department of ornithology that has failed to receive the attention that it deserves or at least has failed to advance along true scientific lines. This may be due in part to the rather surprising attitude of most leading ornithologists toward the method employed in recording bird song, i. e. the musical notation. One ornithologist says

"Musical notation might as well be Greek so far as it gives an adequate idea of song to any other than the transcriber," and another while admitting the difference in tone quality between notes sung by a bird and notes played on a piano, fails to realize the mechanical nature of the piano scale and cites his inability to recognize songs played on the piano from records made in musical notation by one of the leading students of bird song, as indicating the failure of this method. Of forty-one songs played by the pianist "thirty-three conveyed absolutely no impression, we could not even guess at their identity."

There are of course two objects in view in recording bird song, (1) to provide a description of the song that will enable someone else to reproduce or recognize it, (2) to make an accurate record of the song which may be compared with other records made by the same or other individuals, the series forming the basis for a scientific study of the subject.

The first is the phase of the subject that has received most attention. No matter what method of notation or description may be used it is extremely doubtful whether any bird song can be so recorded that one who has never heard it can reproduce it with any degree of accuracy from the printed record. Even such an easily imitated call as that of the Whip-poor-will has to be heard before it can be reproduced with proper accent, speed, and quality.

When it comes to recording a song so that one will be able to recognize in the description a song that he has actually heard, the case is very different and the calls and songs of many species may be so recorded. The method of notation may vary, it may be syllabic or it may be musical but neither will give any idea of quality which can only be supplied, and incompletely at that, by some descriptive clauses. To the musician however the musical notation is by no means "Greek," and with some description of quality he gets a far better idea of a song accurately represented on a musical staff than the non-musician is able to obtain from a syllabic representation.

Some syllabic representations recall the note very accurately as 'Whip-poor-will,' 'Pee-wee,' 'Bob-white'; the 'Pea-body, pea-body, pea-body' of the White-throated Sparrow etc. etc. Others are less happy, while a majority of efforts, where the song is less striking, are almost ridiculous. One has but to compare the efforts of various writers to see how widely their ideas of proper syllabic representation of song differ. When attempt is made to illustrate individual variations of the song of any species by this method one usually loses entirely the points of resemblance between the variations which are so well shown by the musical notation.

The more important phase of the study of bird song is the formation of a series of records as a basis for scientific comparisons and deductions, such records constituting the 'specimens' for this line of investigation. In this work the use of musical notation is absolutely essential, just as mathematics is essential in computing averages and percentages of error, in bird migration, or chemical notation in recording the composition of pigments or other products of the bird's structure. These are all unintelligible to

one who is ignorant of them but a knowledge of them is necessary to investigation in the fields to which they apply.

The student of bird song should not perhaps be too much of a musician; he should moreover have in addition a full appreciation of the importance of scientific accuracy and of the ultimate objects of the investigation. Records to be of value must be made by actual test of each note with a graded pitch pipe, as is done by our best observers, while the time must be correctly gauged by some metronome contrivance. The memorizing of a song and its later transcription on the musical staff, will not suffice.

Accurate records require a vast amount of painstaking effort but they embody the scientific musical basis of the song — that which is essential for its study. They have already shown us that there is great individual variation in the song of any species, the apparent uniformity being due to the identity of certain leading notes or intervals in the songs of all individuals. The possibilities for future work are innumerable. The whole question of mimicry is involved, upon which we have diametrically opposite opinions and between these only a study based on such records can decide. Are the songs of such birds as the Mockingbird really mimicry or is the resemblance to the songs of certain other species merely accidental? When the individuals of a species in the same immediate neighborhood are found to sing in the same key, does it indicate a desire on the part of the birds for harmony or are these birds of common ancestry and have they inherited the tendency to sing at a certain pitch along with other inherited characters? Have birds really an appreciation of music similar to that possessed by man, or is the complementary nature of the songs of several individuals answering one another accidental and due in part to the imagination of the hearer? These and many other questions are awaiting conclusive answers and in investigating them we must remember that bird song is music and in its scientific study must be measured by musical standards. At the same time the need of rigid accuracy and unbiased judgment must ever be kept in mind to guard against the enthusiasm of the musician which like that of the artist is sometimes inclined to run away with him when dealing with such problems.

The American Museum's Colombian expedition of 1913, returned to New York City early in May, after an absence of four months. The expedition was under the leadership of Frank M. Chapman, who had as his chief assistant that experienced collector in tropical America, George K. Cherrie, while Louis Agassiz Fuertes served as the artist of the expedition, and Thomas Ring, Paul Griswold Howes, and Geoffrey O'Connell acted as assistants. The objects of the expedition were to secure material for a Habitat Group of the bird-life of the Magdalena Valley; to determine as accurately as possible the limits of the so-called "Bogotá" region from which, during the past seventy-five or more years, doubtless hundreds of thousands of birds have been shipped; and to collect a series of representative birds from this region which should be properly labeled as regards

date, sex, and especially locality and altitude. We understand that the expedition in all these respects made a great success, no less than 505 species of birds being collected in some forty-five days of actual field work; an indication of the richness of the avifauna of this part of the world.

THE many members of the American Ornithologists' Union who have enjoyed a delightful day's outing at the Club-house of the Washington Biologists' Field Club, on Plummers Island in the Potomac, will congratulate the Club upon the completion of twelve years of ownership of its beautiful island home, which is marked by the issue of an attractive little brochure giving a history of the organization and its work.

As an illustration of what intensive study will yield it may be mentioned that on the twelve acres included on Plummers Island there have been identified, 26 mammals; 143 birds; 18 reptiles; 12 amphibia; 40 fishes; 1500 beetles; 500 flies; 420 bugs; 60 orthoptera, 550 seed bearing plants and 286 lower plants. Papers to the number of 120 have been published dealing to some extent with the fauna and flora of the island and 106 new species, 12 new genera and 2 new families have been based on material collected there.

READERS of 'The Auk' will be pleased to learn that Mr. Robert Ridgway has completed the manuscript of Part VI of his 'Birds of North and Middle America' and is now engaged on the synonymy and keys to higher groups for the remainder of the work.

THE appearance of Index Zoologicus No. II published by the Zoological Society of London and comprising a list genera proposed from 1901–1910 as well as some overlooked names of earlier date, will be welcomed by systematic ornithologists. They will however be surprised to find no mention of Dr. C. W. Richmond's List of Genera of Birds 1901–1905 (Proc. U. S. Nat. Mus., Vol. 35, pp. 583–655.— Dec. 16, 1908), the most important paper on bird genera that has appeared in the period under consideration. We might mention also that the genus *Macrosoma* credited to Aves in the Index, proves to be based upon a reptile, but we trust that such slips are rare.

THOSE who are interested in the stability of scientific nomenclature have felt more or less apprehension as to the outcome of the agitation against the strict application of the law of priority. The result of the discussion at the Ninth International Congress of Zoölogy at Monaco, however, was eminently satisfactory and will inspire confidence in the stability of the International Code and the decisions of the International Commission. According to the report published in Nature, "A resolution was adopted which empowered 'the nomenclature commission to suspend the rules in cases where it would cause great confusion to carry them out. This power

is, however, safeguarded by such stringent conditions that there is no fear of its being used except in very urgent cases." This should be satisfactory to everyone, for if we accept the opinions of the Commission, as we should do, in all cases which give rise to different interpretations of the Code, we can just as easily accept their decision in such extraordinary cases as will be covered by the new resolution. Furthermore the generous attitude of the Congress in devoting so much time to the consideration of the subject and its thorough discussion in the general meeting cannot help but disarm the critics, bring both sides together and make for stability in the end.

MESSRS. WITHERBY & Co. have been appointed European Agents for "The Emu," the organ of the Royal Australasian Ornithologists' Union, and copies of that publication can now be obtained at 326, High Holborn, London.

CIRCULARS 92 and 93 of the Biological Survey U. S. Dept. of Agriculture setting forth the proposed regulations for the protection of migratory birds in accordance with the recently enacted Federal Law reach us just as we go to press. They deserve the careful study and support of all sportsmen and ornithologists.

CYPRESS 'HEADS' ON CHASE PRAIRIE, WITH A FISH HAWK'S NEST.